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Sketching for Ideation:

A Case for Retaining the Conceptual Sketch In Design Education

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1. Abstract

Sketching for ideation can be an invaluable tool for designers—it can encourage visual thinking and help make lateral connections in creative development. Sketching can deepen and broaden creative exploration resulting in more innovative and stronger work, better enabling creative and responsible designers to meet design challenges both as students and practicing designers. Established as an integral part of ideation, in the early stages of a design education, sketching can be an effective agent in the conceptual design process.

This study examines the benefits of utilizing sketching for design ideation through related research from: a variety of published works; interviews and questionnaires with Canadian and American design educators; and, interviews and workshops comparing and analyzing the ideation methods of students in the Visual Communication Design program at the University of Alberta, Canada.

Specific benefits discussed include: how the inherent, ambiguous nature of sketching can be an aid to designers due to the interpretive possibilities fostered; how sketching alleviates potential conflict from the procedural and operational thinking that can accompany the use of design software for ideation and conceptual exploration; and, the self-generating archive of creative visualization that acts as evidence of exploration for reflection, discussion with others, as well as inspiration for other projects.

2. Introduction: Sketching as a Method for Concept Development

Sketching, then, as part of design thinking, is at the very heart of creation bridging daydreaming and calculation (Jonson 2002, p 250).

As well as communicating clearly, designers strive to bring creativity and innovation to the design work they produce. The use of sketching for ideation, to work through and visualize conceptual approaches, can be an invaluable tool for designers to aid free thinking and help make lateral connections. It can help ensure a thorough exploration of design possibilities. Established as an integral part of the conceptual design process in the early stages of design education, sketching potentially can deepen and broaden a student's conceptual exploration and is part of establishing a good working process.

Related research on the role of sketching in the conceptual design process and how it can foster further approaches is discussed in the chapter **Context** (3) additionally discussed is the impact digital technology has had on sketching. **Research** (4) discusses the questionnaires, workshops, and interviews that were completed as primary research (later detailed in this Introduction). **Analysis** (5) examines and synthesizes the primary and secondary research for this study on the use of ideation into three themes: where the ambiguous nature of the conceptual sketch is discussed as a strength; how procedural and operational thinking can affect conceptual thinking; and, the importance of a visual record for reflection as part of gaining experience and skill building in design ideation. The overarching and guiding question posed for this inquiry is discussed in 2.1.

2.1 Ideation for Graphic Design: Drawing Lines

This study began by looking at sketchbooks in design education with an understanding they functioned as the tangible evidence of conceptual and exploratory work. Sketchbooks are a vessel for capturing the ideas, words, notes, and ideation for design projects, whether accomplished digitally or traditionally with pencil and paper. As the research progressed, it became apparent that what was being addressed was ideation: how design ideas might be encouraged and expressed, and the impact that technology has had on this aspect of the design process.

This evolution brought the focus specifically to the types of thinking that occur in design and how ideation or the conceptual development of ideas as part of the design process occurs. It also takes into consideration the impact of digital technology on sketching and ideation. Directing the questioning to ask: How are current visual communication design students approaching the design challenges presented to them? By hand on paper? Strictly digitally? Or a mix of both? And does this affect the depth of their exploration? As a result of these questions, the focus of this thesis became **Can the utilization of sketching for ideation aid the conceptual design thinking of a visual communication design student?**

The primary research undertaken to answer this question began with a very short indicator poll to design educators in January 2010. The responses received confirmed a reduced student engagement of sketching in the traditional sketchbook (Appendix 3). With this confirmation, in April 2010, an email survey with seven questions was sent to educators in both Canadian and American schools of design (Appendices 4–7). This was followed by interviews with nine design educators in June and July of 2010 (Appendices 8–10). Taking information gained from the design educators, and structured to compare the ideation processes of visual communication design students, two one-hour workshops were presented in January and March of 2011 (Appendices 11–19). Each workshop concluded with a short questionnaire asking the students about their experiences in the workshop as well as their typical habits when beginning any design project (Appendices 14 and 18). Finally, in April 2011 six University of Alberta Visual Communication Design students at various levels in their design education were interviewed (Appendices 20 and 21).

Analysis of the research presented here takes into account my own design education, teaching, and professional experience. Studying design at the end of the 1980s was a transition time when computers and the possibility to practice design in a digital environment was just beginning to be incorporated into design education and practice. Ideation by hand was standard practice, not an option.

The research results of this thesis represent current trends within an ever-evolving technological landscape. Findings are presented with the expectation that design software, and its incorporation into design practice and teaching, will continue to evolve and change over time with varying degrees of impact. However, the need for creative exploration and searching for new ideas to visually communicate messages will always remain. An awareness of the impact these evolutionary changes can, and do make, is significant to the schools of design and the education they provide toward graduating able designers who can recognise and address the design challenges presented to them in an effective and responsible manner.

2.2 Definitions of Terms

For clarity, the following are definitions of terms used throughout the text:

- *analogue* refers to sketching by hand with pen or pencil and paper;
- *drawing* in quoted research refers to sketching;
- *digital* or *digital technology* refers to a computer interface;
- *digital designing*, the use of a computer software package at the outset of a new project;
- *digital sketching*, sketching on a tablet or with a digital device that has an intuitive and operationally minimal graphic interface to simulate sketching on paper;
- *conceptualization and visualization*, are used interchangeably throughout the text and refer to actions during the idea generation process;
- *Gen Y* students belong to the demographic group born after 1981 whose perceptions, skills, and thinking are influenced by exposure to digital technologies (Ivanova and Smrikarov 2009);
- *ideation* is the formation of ideas or concepts;
- *sketching* (also defined in 3.1) refers to sketching by hand on paper or on a tablet or with a digital device that has an intuitive and operationally minimal graphic interface to simulate sketching on paper;
- *procedural* and *operational* and *thinking in software* refers to the procedural actions required to accomplish a task when using any software program;
- *tool* refers to the use of sketching as a vehicle, one of many, which can aid in creative exploration;
- *visual communication design student* refers to a student of graphic or two-dimensional design.

Though an attempt has been made to be focused in the collection of representative information, the research undertaken for this study represents a limited sampling of opinions and participants. A larger study would be required for more definitive and robust conclusions. As well, some of the published research noted here has been drawn from studies with reduced numbers of participants.

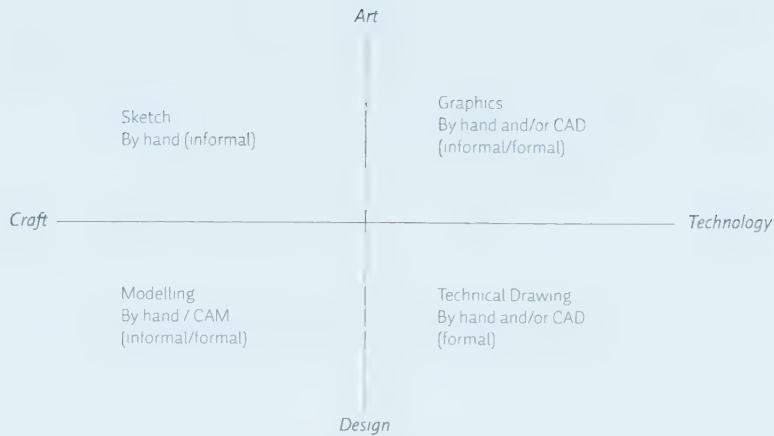
3. Context

The research discussed in this chapter brings together work from educators and researchers who have studied sketching and ideation within the design process. As well, research that has considered the changes that technology has had, and continues to have, on the field of design specifically relating to education is presented. Within **Themes Framing My Inquiry** (3.3), five broad themes, or aspects, are presented that help to frame the chapter: **Traditional Methods** (3.3.1), outlines types of sketching and how sketching can function in design thinking; **Interaction with Self and Others** (3.3.2), discusses a visual dialogue between the sketch and designer and how this can foster further exploration; **Cognitive Interactions** (3.3.3) discusses the role of cognition and memory; **Reflection** (3.3.4), discusses the role of reflection in ideation and learning; and, **Positive Ambiguity** (3.3.5), explores the inherent ambiguity of a sketch. Before delving into the sections outlined above, sketching is located within the design process, the *digital native* student is defined, and the impact digital technology has had on the place of sketching in design education is discussed.

3.1 Ideation: Exploring Possibility

Conceptual sketching for design, whether created by hand or digitally, is essentially about possibility. In the words of Ben Jonson, a designer, researcher, and associate lecturer at Central Saint Martins College of Art and Design, sketching is about “what can be. Thus the sketchpad can be seen as a place in transition, an observation point for multiple views, expressed on paper or on screen, as conventional, abstract or virtual marks” (2002, p 251). He describes sketching as “a form of visual improvisation” (2002, p 252). The research conclusions of Verstijnen and Hennessey support Jonson’s description, stating that sketching can have an important role in discovery. They admit the statement seems rather “audacious” but, making reference to their research “this is what is frequently reported by artists and designers” (1998, p 520).

Locating sketching in the design process, Jonson plots a matrix of analogue and digital working practices. Closest to what he considers *creative design*, the analogue or freehand sketch is placed into the art/craft quadrant because it is utilized in developing new design solutions where routine design development utilizes more digital or computer-aided design.



Digital and analogue working practices plotted to locate sketching in the design process, from “Sketching Now” (Jonson 2002, p 249).

As a working definition for sketching within the design process Jonson proposes: “A series of rapid marks of varied explicitness and completeness that are made by a multitude of means in the early phase of the design process for the purpose of production” (Jonson 2002, p 251).

3.2 The “Digital Native” Student

Studies have highlighted the changes, needs, habits, and expectations of the Gen Y student. Julie Evans, CEO of Project Tomorrow, an American K to 12 national education organization, reported in 2009 that students who have utilized technology consistently from the very start of their schooling in the U.S. will begin entering post-secondary study in 2010 (2009). Making reference to the ubiquitousness of technology in our lives, Marc Prensky, a writer and speaker on learning and education, uses the terms *digital native* and *digital immigrant*. The digital native is someone who grew up with the digital technology of the late 20th century (in this case usually the student); the digital immigrant was born prior to this and has adopted digital technology later in life (most design educators fall into this category) (Prensky 2001). Technology and the use of software and the computer is closer to the native tongue of a student than to most of the design educators teaching them. Prensky elaborates (author’s emphasis):

It is now clear that as a result of this ubiquitous environment and the sheer volume of their interaction with it, today’s students *think and process information fundamentally differently* from their predecessors. ...it is very likely that our students’ brains have physically changed—and are different from ours—as a result of how they grew up. But whether or not this is *literally* true, we can say with certainty that their *thinking patterns* have changed (Prensky (2001).

In “Developing a Taxonomy on Drawing for Design” Pamela Schenk, a design educator who has researched the role of drawing in design since the mid-1980s, stated that “While many design academics still believe that drawing should have a place on the curriculum, they also acknowledge that that place is under pressure” (Schenk 2007). “Indeed, within the graphic design profession the understanding of the role of drawing in the design process and the capacity to use drawing effectively has, in many respects, diminished” (Schenk 1991, p 195).

Schenk notes that promoting the benefits of drawing to students has become increasingly difficult over the past two decades as the use of the computer has grown. Schenk’s research and experience in teaching has shown that “many young designers now feel that they can use the computer for any aspect of the design process which their predecessors conducted through drawing” (2007). Although she can understand this attitude, she states “there is much evidence to show that, in spite of the benefits of the computer, drawing remains vital in a designer’s capacity to explore and express ideas” (Schenk 2007). Her research with academics and designers identifies two main reasons for the importance of drawing ability to a designer, first, “to support conceptualization and, secondly, so that drawing can be used to facilitate communication of design ideas to others” (Schenk 2007).

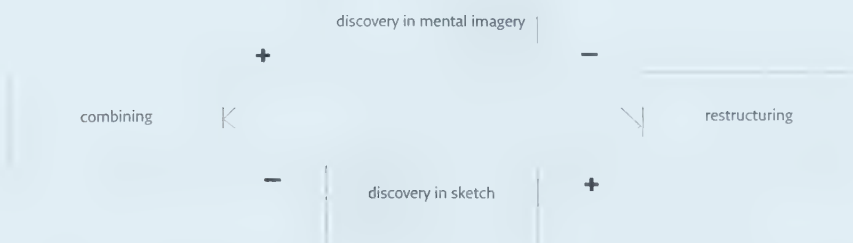
In “The Why and How of Drawing: A 20 year shift in design procedures and priorities” Schenk, makes reference to the process of the pre-computer design industry and the incorporation of drawing courses that prepared students for it. Schenk began her research when the design process was largely paper-based and has continued through where now the design process is “extensively facilitated by digital means” (2007). She acknowledges the need for a designer to have competence with software as part of their repertoire of skills, but also points out from her studies into the habits of print, textile and industrial designers over the last 20 years: “The consistent and overwhelming finding of this work [her research] is that drawing remains at the very centre of the creative and developmental process of design” (Schenk 2007).

Christina Haas in “How the Writing Medium Shapes the Writing Process: Effects of Word Processing on Planning” studied the effects on the planning process for writing between pen and paper and the word processor. The results for both experienced writers and student writers were the same—planning was much more extensive when using pen and paper. (1989, p 181). When using the word processor, planning was less conceptual and the thinking more sequential, and there was an “over-attendance” to fiddling and tidying up the writing (Haas 1989, p 202). Haas’ research did not analyze the final written product as part of this study.

Paralleling this significant impact on writing to the design process, Catherine Stones, a design educator and Tom Cassidy, Chair of Design and Director of Research at the University of Leeds, in their paper “Seeing and discovering: how do student designers reinterpret sketches and digital marks during graphic design ideation?” argue “it seems

reasonable to suggest that design software could play an even larger part in the way we design—not only in the restructuring of design activity and focus but also, given the importance of visual information for the designer, the way we generate ideas” (Stones and Cassidy 2010, p 440). Stones and Cassidy’s research looked at the impact tool use can have on the way a designer reinterprets marks into new ones. Their research considered two tools, “use of pencil and paper (resulting in a sketch) and the digital design tool (design software running on a computer system)” (Stones and Cassidy 2010, p 440). The conclusion of their paper states, “paper marks appeared to provide richer opportunities for reinterpretation that stimulated new ideas” (Stones and Cassidy 2010, p 447).

In a 1998 study looking at the psychological behaviors of designers and the benefits of using computer tools for supporting conceptual sketching, Verstijnen and Hennessey identified two processes as essential to the creative process: restructuring (to synthesize existing elements into a recognizable object) (1998, p 524). These processes are influenced both by an individual’s skill of sketching and individual creativity. Schematically described below, the conclusions from their testing with designers is that, although the combining process is easy to perform in mental imagery and is not aided by sketching, the restructuring process is difficult to perform in mental imagery and is more effective when sketching is utilized. The results of their studies with regard to recommendations for the development of computer tools for sketching was that they must have a “low threshold of accessibility,” and not exceed the level of expertise of the user, and be “intuitive” (Verstijnen and Hennessey 1998, p 542).



Schematic showing the two processes essential to the creative process: combining (easy to perform in mental imagery, not aided by sketching) and the restructuring process (difficult to perform in mental imagery, better with sketching) (Verstijnen and Hennessey 1998, p 542).

3.3 Themes framing my inquiry

From analyzing the secondary research five broad themes or aspects that help frame this inquiry into sketching became evident: traditional methods; a visual dialogue between the sketch and designer, potentially fostering further exploration; cognition and memory; reflection; and, drawing as a skill.

3.3.1 Traditional Methods

Sketching, as a way of expressing initial ideas as well as preparatory drawings, in the Renaissance was called *primi pensieri*, meaning first thoughts (Jonson 2002, p 250). The etymology of the word “sketch” is from Greek *skhedios* meaning done without planning or preparation (Oxford Dictionaries Online) and from Latin *schedius* meaning “hastily made, it signifies that which is unprepared, incomplete, raw, rough and unpolished as well as urgent, all at once, by fits and starts, and at short notice” (Jonson 2002, p 248).

Designer and design educator Philippe Apeloig describes sketching as integral to the process of design because of the freedom and exploration it provides. As a Professor at The Cooper Union, Apeloig attempted “to bridge the gap between the technological obsessions of his students and the perennial need to develop a typographic sensibility beyond the defaults of the computer” (2001). In an interview in 2001, regarding the inspiration for his personal work, Apeloig stated, “Sometimes my ideas come to me rather backhandedly. I imagine a certain composition, then through the drawing process another one becomes clear.” In the same interview, his response to a question about his feeling with regard to new technology in the profession was, “They all interest and involve me. ...new technologies will not change the creative process, which still depends entirely on the imagination of the designer. I am not attached to my computer, I often step away from it to work with a pencil and a sheet of white paper, allowing my creative mind to zigzag as it likes” (Apeloig 2001).

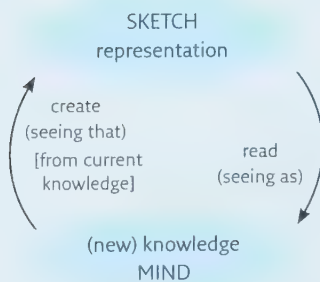
This zigzag is what Jonson refers to as the strength of the freehand sketch “its economy of means (low cost), immediacy (single tool interface) and ease of low-level correction and revision (scribbling over, erasing or a new sheet of paper)” (2002, p 247). Jonson also describes three types of freehand sketching: “a means of self-expression (here called I-sketch); as a means of communication, in the team situation or in the designer-client relationship (We-sketch); and, as a means of recording low-level analogue visual information, with or without annotation (It-sketch)” (2002, pp 247-48). In this articulation of the types of sketches, Jonson is defining the sketch by the communicative value, where the creator is often the only audience.

Jessica Helfand, a graphic design educator, refers to sketching as the act of thinking through making, slowing down the process and allowing for a more direct (concept to concrete), individual, and open ended exploration of a design solution, “design serves a pragmatic need, but that doesn’t mean its point of departure needs to position itself so firmly in the realm of logic, does it? Drawing, as the primary gesture of making, reopens the doors of the imagination and recasts the process” (Helfand 2006).

3.3.2 Interaction with Self and Others

...designers do not draw sketches to externally represent ideas that are already consolidated in their minds. Rather they draw sketches to try out ideas, usually vague and uncertain ones. By examining the externalizations designers can spot problems they may not have anticipated. More than that, they can see new features and relations among the elements that they have drawn, ones not intended in the original sketch. These unintended discoveries promote new ideas and refine current ones. This process is iterative as design progresses (Suwa and Tversky 2002).

Sketches allow for a dialogue between the sketch and designer; they help a designer to develop a better understanding of the problem as well as to generate new ideas (Goldschmidt 1991, p 123). Gabriela Goldschmidt, Professor Emeritus, Faculty of Architecture of the Technion - Israel Institute of Technology states that, for an architect, sketching is a mode of visual thinking and the imagery is a conceptual framework for investigation. She describes the backtalk of a sketch in progress (Goldschmidt 2003, p 72) as an oscillation of arguments between design moves and arguments that gradually transforms images by way of a systematic back and forth of *seeing as* and *seeing that* reasoning. The arguments are the labours, the exploration and reasoning of the designer's mind. The moves are the physical representation of the arguments (Goldschmidt 1991, p 125).



Schematic representation of the dialogue between sketch and human, based on Goldschmidt. (Tohidi 2006, p 106).

Beginning with current knowledge, the sketch is created with seeing that reasoning (left arrow); interpretation of the sketch (right arrow) results in new knowledge in the form of seeing as reasoning. The cyclical nature of this process allows for an increasing improvement of the design, even if the person creating and the person reading are the same. To Goldschmidt sketches are not merely representations of images designers have in their mind, she believes the act of sketching is a vehicle for design thinking. "The dialectics of sketching is the oscillation of arguments which brings about gradual

transformation of images, ending when the designer judges that sufficient coherence has been achieved” (Goldschmidt 1991, p 123).

Warren Berger in his book *Glimmer* quotes Milton Glaser, an influential and iconic American graphic designer, describing his own design process of an oscillating dialogue between sketch and designer. Glaser’s description of exploratory sketching—the process of sketching, not just to depict and share ideas, but to actually find them—supports and echoes Goldschmidt’s analytical breakdown in a visceral way. Glaser’s description of his working process is much like an artist’s exploration allowing the medium to lead, or like Michelangelo releasing a sculpture from a block of marble.

There is a dialectic that exists between sketching and the way the brain functions, between the hand and the mind. When you’re searching for an idea, very often what you’ll do is create a kind of ambiguous sketch of it. And the brain looks at it and says, ‘Ah, it could be this or that,’ and the hand transmits what the brain has observed and makes the sketch less fuzzy. Then the brain says, ‘But maybe it should look like this,’ and the hand accommodates again—and this conversation between the hand and the brain results in the development of an idea. Glaser claims not to direct the process as much as go along for the ride (Berger 2009, p 74).

Glaser’s description parallels the description of an *active* drawing that Industrial Design educator Andy Loewy provides to his students. Loewy states an active drawing is one where the designer is searching and developing ideas simultaneously through sketching. Being mentally attentive to visual ideas and possibilities as they create, the designer is either trying to explain something, understand something, or resolve a problem, with themselves or with others. “I tell them [the students] that designers have an ongoing internal dialogue of images, ideas and solutions to problems. Drawing helps define the thoughts that otherwise might never be realized” (Loewy 2008). He defines two types of drawings that serve different needs, active and passive. The first, being a problem-solving drawing, the second is more illustrative and shows what the project looks like.

Active drawings, he believes, are an extremely important design tool. “It is the method that designers use to resolve problems, an important communication skill that is often the catalyst for further design solutions. We’ve all witnessed wonderfully informed, thoughtful drawings that are drawn on napkins or scraps of paper, because there was an urgency to get an idea across either to oneself or to others” (Loewy 2008).

In the article “Dialectics of Sketching” Goldschmidt, referring to experienced and less skilled designers, states that less skilled designers cannot “‘ping-pong’ across modalities as can experienced and expert designers” (1991, p 139). By *ping-pong* Goldschmidt is referencing the oscillating argument discussed earlier in this chapter where visualized concepts foster additional concepts in a cyclical or back and forth fashion.

3.3.3 Cognitive Interactions

The externalization of a conceptual idea as an aid in freeing memory has been researched by David Ullman who considered the importance of drawing during the process of mechanical design. Ullman stated that designers need to externalize ideas because of limitations of short-term memory (1990, pp 266–67). Educator, scientist, and artist, Jonathan Fish, articulates this further by referring to sketching as a cognitive catalyst:

...early design sketches are like catalysts in that they can combine with and transform at high speed superimposed mental information in working memory. They are not complete representations but temporary representation holding structures that help the inner designer to manipulate and transform the invisible representations of design thought (2004, p 169).

The idea of sketching concepts and ideas to clear mental space is a potential bonus of externalizing design concepts through sketching. This externalization also allows for easier comparison between solutions as well as potentially more mental energy that can be used toward further creative exploration and making connections between concepts already visualized because they are concrete and easily compared. Barbara Tversky, from the Department of Psychology at Stanford University, in her paper “What do Sketches say about Thinking?” describes sketches as “a kind of an external representation serving as a cognitive tool to augment memory and information processing by relieving the mind of some of those burdens” (1999).

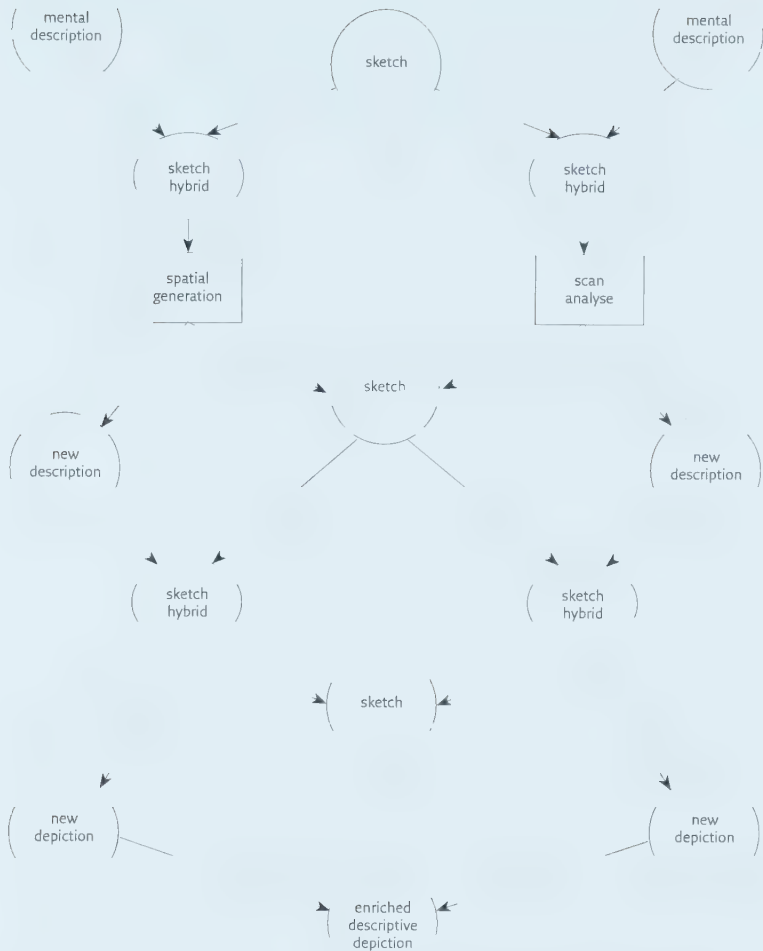
Zafer Bilda, an experience designer and researcher, compared the differences in the cognitive activity of architects during conceptual design. In two separate sessions, one where the architects were blindfolded and not allowed to sketch, and another, where the architects were not blind-folded and were allowed to sketch Bilda, Gero, and Purcell found that overall cognitive activity dropped during the blindfolded sessions. This reduction was attributed to the higher cognitive demands during the blindfolded conditions. “Externalization is needed to off-load the visuo-spatial working memory, and for the same reason drawings and diagrams play an important role in designing” (Bilda et al. 2006, p 608). Notable is the fact that the blindfolded sessions were for a limited time—the authors believed if the sessions had been for an extended period the cognitive load would have been larger with the participants possibly fatigued and frustrated because of this. “The answer may be that it is easier to sketch, in other words, sketching puts much less load on the cognitive processes needed to design. ...the results of the case study implied that the use of imagery alone could be an efficient tool for quick and focused idea development in the early conceptual phases of designing” (Bilda et al. 2006, p 608).

Manolya Kavakli, an Associate Professor in Computing, who has researched design cognition and system design in computer games and virtual reality, considered the design protocols of novice and expert designers. Her research showed a difference in the balance of cognitive actions between novices and experts. She found the expert to be more active and productive in the conceiving phase in terms of cognitive action and producing alternates. Kavakli's conclusion was that this imbalance was due to the rate of information processing gained by experience. Testing showed a rate twice as high for remembered information in experts over novice designers (Kavakli 2001, p 362).

Jonathan Fish describes two types of mental interactions designers have with sketches. The first, where the sketch acts as a clue for remembered objects, is related to the retrieval of implicit knowledge, with sketches and notes acting as access keys to much larger memory components. The second, is where the sketch acts as "skeleton support structures for superimposed mental imagery" (Fish 2004, p 173). In "Cognitive Catalysis: Sketches for a Time-lagged Brain" Fish shows diagrammatically how a sketch can act as "a mental translation catalyst" (2004, p 174). He describes the flow of the process as:

...mentally represented propositions temporarily combine with written notes or symbols and partly descriptive elements of the sketch. Skillfully used, these sketch components decrease the mental effort needed to retrieve stored descriptive hierarchies and object descriptions that are in turn used to generate new depictive images. Incomplete contour fragments of the sketch then act as temporary holding structures for precept-image hybrids (Fish 2004, p 174).

These hybrids provide a "more stable platform" (visualization) for "image scanning" (evaluation) to glean a new description. Fish's approach is similar to the cyclical process of *seeing as* and *seeing that* described by Goldschmidt in her study of the thought processes of architects (Fish 1991, p 125).



Diagrammatic description of the “sketch as translation catalyst” (Fish 2004, p 174).

Barbara Tversky, Professor of Psychology, Stanford University, in “What Does Drawing Reveal about Thinking?” states that drawings to a designer differ from images “in that they reflect conceptualizations, not perceptions, of reality” (1999).

Rudolf Arnheim in “Sketching and the Psychology of Design” comments on Goldschmidt’s ideas in “The Dialectics of Sketching” concerning her statement that, in making a sketch a designer, “supplies the mental image with the assistance of the optical image” (1993, p 17). Arnheim elaborates saying this sketch is tangible, concrete, and can be vague, but this vagueness has a precision. Arnheim quotes one of the designers interviewed by Goldschmidt in her research, “‘I like the fuzzy stuff, I can see things in it more than I can in the harder-lined things’. A sketch is a reflection

of the guiding mental image; but it is not, and cannot be, identical with it, and this difference is precisely what makes it a precious instrument for the designer” (Arnheim 1993, p 17). Later in the essay Arnheim makes reference to the sketching process working toward the completed solution as “the goal image prevailing throughout the process of problem-solving. Since this goal is not given but only aimed at, it is only potentially present in the image at this particular stage” (1993, p 17). The dialectic process described by Goldschmidt in 1991 is not between the drawing and the image the designer has in their mind; it is between the goal image, being the final realization, the imagination and the sketch.

To Sunni Brown, author of *Gamestorming: A Playbook for Innovators, Rule-Breakers, and Changemakers*, a book on techniques of how to innovate for business, sketching is connected to taking in and processing information. She refers to sketching as “doodling” and defines it as “to make spontaneous marks to help yourself think.” Brown states that we need two of four modalities activated when we are processing information: visual, auditory, reading and writing, and kinesthetic. And because sketching involves all four modalities simultaneously, it can be utilized as a portal to higher levels of visual thought (Brown 2011).

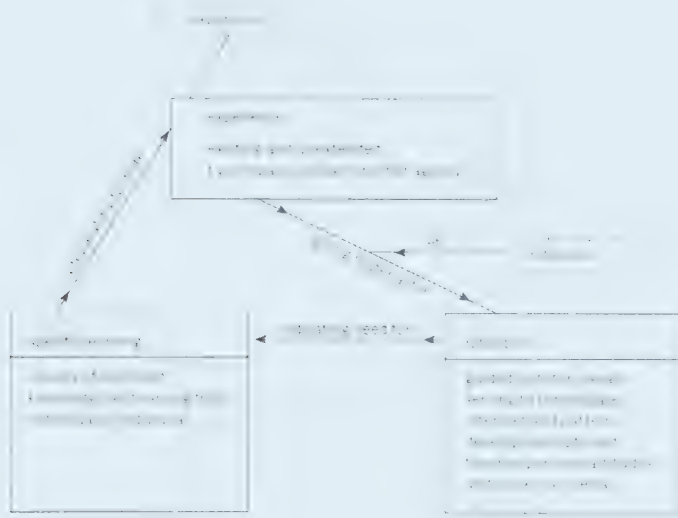
3.3.4 Reflection

The role of reflection is an established part of learning and has been researched as part of the creative design process. The potential for reflective time during the exploration of visual solutions can possibly make the student more aware of the elements they have chosen to utilize, and how they are utilizing these elements. Exposure to, and the use of alternative processes, allows the student to think of digital media more as one of many tools at their disposal.

An educator and social scientist, Donald Schön's research focused on the role of reflection in experiential learning. Schön examined how professionals in the fields of engineering, architecture, management, psychotherapy, and town planning solved problems. His theory was that they knew more than they could put into words, and relied on improvisation learned in practice (Schön 1983, pp 49–51). Interested also in the designers' creative way of working and how the practice of design is experienced, Schön's concept of reflection-in-action, a kind of thinking what we are doing while we are doing it, looked to understand how students learn in the design studio. His theories were directed to incorporating the practice of reflection into studio practices within an architectural education to improve both teaching and learning (Schön 1985, pp 50–52).

Including reflection as a part of the learning process, the British Further Education Curriculum and Development Unit (FEU) in 1981 proposed a three-phase model “including the experience of the learner, the specific learning that occurs on the basis of the experience, and the reflective activity needed to extract specific learning from the overall experience” (Boud 1985, p 13). The FEU describes the role of reflection in

the model as “The individual’s experience needs to be followed by some organised reflection. This reflection enables the individual to learn from the experience, but also helps identify any need for some specific learning before further experience is acquired” (Boud 1985, p 13). The reflective activity allows for a “crystalization” and reinforcement of previous learning, as well as the development of concepts and generalizations for future use.



A model proposed by the British Further Education Curriculum and Development Unit showing the role of a reflective activity as part of the learning process (Boud 1985, p 13).

A study by Tohidi, Buxton, Baecker, and Sellen looked at techniques that would allow for more active involvement of end users in the design process during user testing. Beyond questionnaires, interviews, and observation, Tohidi and his colleagues were looking for ways to facilitate reflection that they believe “is required to generate design ideas and alternate solutions” (2006, p 105). During the study, participants were asked to provide a sketch of their idea after they had provided verbal feedback. The results received were significantly different from the those obtained from the other methods. Participants who offered no further verbal comments at the end of the interview portion of the study had additional comments after creating a sketch of their own. The conclusion of the study was that sketching facilitated reflection and discovery better than other methods (Tohidi et al. 2006. p 113).

David Airey, a Scottish designer whose primary work is creating visual identities, allows a minimum of two-days for mind mapping as part of his design process, as it gives him at least a one night break to step away from the project and gain a fresh perspective. In his work, Airey does not use a computer until a concept is set. He refers to sketching as a conceptual playground and states “By removing the computer from the creative

process, you gain much more freedom when translating your thoughts” (Airey 2010, p 96). He does not concern himself with drawing skills and continuously references his mind maps so that both the sketches and mind maps act in tandem toward the final solution.

3.3.5 Positive Ambiguity

Sketchbooks are not about being a good artist, they’re about being a good thinker (Maria 2009).

Initial working out of ideas can be ugly or crude, you don’t criticise them for that, because their first aim is not to please but to find something out. Richard Wentworth, British artist, curator, and teacher (from Jonson 2002, p 250).

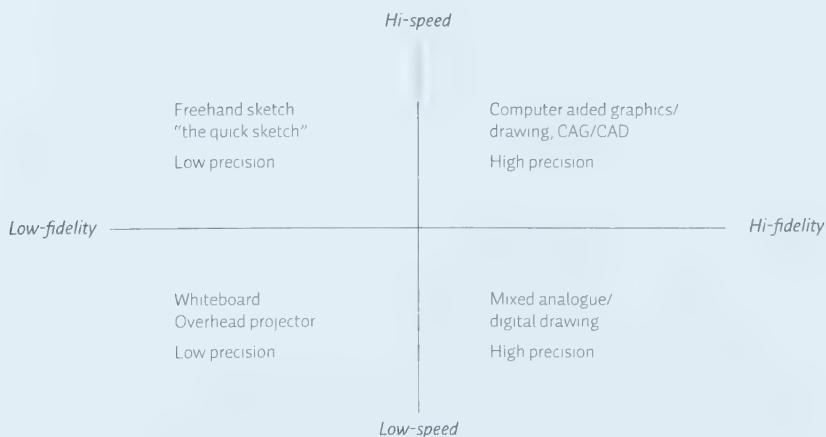
Previous generations of visual communicators have relied on sketching to visually think through and illustrate, for themselves and others, potential solutions to design problems. The skill of rendering an accurate and perfect likeness to life is not the goal of drawing and sketching in design ideation. It is a notation, an attempt to capture or work through a concept while searching for an idea or solution to a visual problem that is important. The fact that this can happen very quickly, easily, and broadly, is what makes sketching a useful skill.

Mike Roy, a design consultant and educator, claims that one thing that keeps people from drawing in design is the fact that drawing came from the arts; and as a result comes with expectations of competency. He sees drawing in design as a tool for communication and to support the design process; it is useful in explaining concepts to other people. He thinks there is a criterion for “good” in both art and design, with the good in design being communication clarity. Drawing for design ranges from a quick overview that is abstract and lacks detail, to the concrete that has detail and specifics. Roy uses the metaphor for the use of drawing in design as the perspective from a plane at 40,000 feet. “From that level what you see out the window lacks detail, the best descriptions are abstractions; detail is not possible and not really desirable. Closer to earth, at a more concrete level detail becomes not only more possible but much more useful” (Roy 2011). It is really a repositioning of what constitutes good drawing from a historical perspective. Good drawings are nice, but not essential in the design process because it is much more valuable to be able to visualize and clearly work through and articulate a design concept quickly in the conceptual phase of design. Roy offers workshops in hand sketching to build confidence in rapidly visualizing ideas and keeping sketches simple and free of too much detail. He sees sketching as a fundamental activity in the design process (Roy 2011).

Though containing a significant amount of information, and therefore valuable as a trigger by the nature of their ambiguity and specific intent, concept sketches often can only be understood by the creator. Irving Biederman in “Recognition by Components: A Theory of Human Image Understanding” notes that even with only the small amount of information contained in a simple line drawing of an object, the line drawing is recognized at least as quickly as a detailed colour photograph of the same object (1987, p 115).

Catherine Stones and Tom Cassidy in “Seeing and discovering: how do student designers reinterpret sketches and digital marks during graphic design ideation?” discuss the “differences in ambiguity levels of conventional paper-based sketches and digital tools” (2010, p 439) and the important role of reinterpreting those marks into other forms. The conclusions of their research suggest that “paper-based sketches, more than digital tools, can support the vital process of reinterpretation that generates new ideas” (Stones and Cassidy 2010, p 439).

In the matrix on speed and precision of medium, Jonson analyzes the differences between digital and traditional hand sketching comparing the speed and accuracy of the two modes of sketching. He qualifies the matrix as suggestive rather than descriptive and clarifies the quick sketch as referring to “the forward and backward movements of eye and hand in drawing rough ideas quickly” (Jonson 2002, p 251).



Comparing speed and precision of medium. Speed does not equate with the potential creative and communicative content (Jonson 2002, p 251).

Considering various media and their influence on design thinking, Alex Zubryn, Coordinator of Drawing and Illustration in the Bachelor of Design program at the Royal Melbourne Institute of Technology (RMIT) in Australia, is interested in how “drawing and hand made imagery support visual thinking and are a critical and reflective form of

investigation in the area of communication design.” Well developed digital skills from a design education are expected of recent graduates going into any design studio, but Zubryn believes the narrowness of one medium can be seen as problematic and “can threaten to sacrifice visual thinking within a variety of mediums.” Zubryn questions whether drawing practices should be more prevalent in design programs, “The varied educations from which they have arrived encouraged various visual abilities and thought structures. Design education should encourage students to further explore and expand on such visual experiences rather than directing visual thinking into predominantly digital outcomes” (Zubryn 2011).

3.4 Differences in the Digital Environment

They understand drawing as a rich and peerless language of the visual mind...drawing survives in this digital age because...there is no better process for exploring and expressing visual ideas with the directness, personal expressiveness, or inventive specificity that drawing provides. It is the visual mind’s best, fastest, and most flexible way of thinking (Brown 2008, p 142).

In describing the differences between sketching by hand and sketching electronically “that is sketching mediated by a pre-loaded (‘prepared’) event-driven software program,” Ben Jonson questions whether the computer process “encourages designers to go straight into finished work without the critical and creative thought period” (2002, p 248). Jonson ventures to question if the difference between sketching on paper and on screen “may have less to do with the differences in the nature of analogue and digital tools than with the effects of changes in organisational structure and culture due to computerisation, in other words, issues of human-computer interaction” (2002, p 249). To a student of design the ability to develop a polished or a seemingly near finished product early in the conceptual stage in a digital environment can be very seductive.

Jonathan Fish and Stephen Scrivener in the 1990 paper, “Amplifying the Mind’s Eye: Sketching and Visual Cognition,” caution against sketching digitally [here Fish and Scrivener are referring to *digital designing* (defined page 4), working in a software program intended for the design and assembly of final work, not ideation]. Citing the possibility of having to provide too precise and detailed of information early in the process because this would “limit the ability to discover unexpected or original solutions” and the “predictability of many computer sketching functions inhibits unnecessarily the serendipity that may accompany the vagaries of conventional media” (1990, p 117). Though software has changed dramatically since this time the sentiment of their caution still holds value.

Christopher Grubbs, illustrator and fine artist trained as an architect, states “the computer...doesn’t handle serendipity, insight, or happy accidents well. It requires the kind of organized thought that can be the death of inspiration and magic. The image the computer screen provides the struggling designer is the worst kind, clear, sharp, colorful and attractive—all superficial qualities that make an unresolved idea look polished and complete, discouraging further consideration” (Grubbs 2008, p 111).

In a *Design Observer* article, “The Art of Thinking through Making,” Jessica Helfand, design educator, talks about design serving a need, and how “drawing reopens the doors of the imagination” (Helfand 2006). Paralleling the idea of thinking through writing, in the article she also makes the admittedly bold statement that, “thinking through making is perhaps unique to designers” (Helfand 2006). As a design educator, this is what she asks of her students. She thinks that the pencil is the point at “which idea begins to approximate form” (Helfand 2006). The following are some comments from readers posted to *Design Observer* following the article:

I think drawing is exciting to look at precisely because the thinking is present and active—layers of re-thinking that we never see in the finished product of our designs.

...the vast majority of my peers skip the sketching process entirely, not because they don’t brainstorm or visually explore, but simply because they don’t do it via illustration.

There is a new fleet of young designers who create only in the machine... the creative exploration happens solely in the machine.... Is their method of generation less valid? As designers we all think, but not everyone has the ability to pick up a pencil and make something.

Try to make twenty thumbnails in ten minutes on a computer. I have watched my own students push images and text around on the screen for half an hour or more in order to work out a composition that could have been sketched in 2 minutes on paper.

Initially I used to be from the Why use a pencil [school]? I can draw using the computer school of thought, but after years of working this way, I found that what I produced had a visual vocabulary that was limited and derivative. After moving back to working with a pencil (as one of the many other tools—camera, computer, knife etc) I found my visual vocabulary to be more open and the creative process a lot more enjoyable and fluid.

The last comment that follows Helfand’s article regarding the strengths of sketching for ideation agrees with the research conclusions of Verstijnen and Hennessey (page 5) that sketching can play an important role in discovery. Schenk’s research also

overwhelmingly concludes that “drawing remains at the very centre of the creative and developmental process of design” (2007, p 3). One of the strengths of sketching lies in ambiguity and how this ambiguity can foster further innovation. A fostering that Bilda, Gero, and Purcell’s research states can be more important to students than to an experienced expert. Also important to a novice designer is a lack of experience in the process Goldschmidt articulates as a designer’s internal argument as they work through possible solutions. Despite the positive aspects of sketching for conceptual development, Schenk states that the use of sketching as part of a design education has declined.

Within the context of design education, five broad themes were defined to help frame a discussion about sketching and ideation: **Traditional Methods** (3.3.1), **Interaction with Self and Others** (3.3.2), **Cognitive Interactions** (3.3.3), **Reflection** (3.3.4), and **Positive Ambiguity** (3.3.5). The following chapter, **Research**, discusses the structure and findings of the primary research conducted for this study. Each of the five main stages: indicator poll, email questionnaire, design educator interviews, student workshops, and student interviews are described. As each stage of the research informed the next progressively, the chapter is organized chronologically. Selected responses, and collated results are included where appropriate.

4. Research

4.1 Introduction

The primary research conducted for this study is presented here in components representing the five major stages, each of the five research components informed the next progressively. As a first stage, a two-question email **indicator poll** (Appendices 2 and 3) was sent out to test the validity of the research topic. With the topic confirmed, an **email questionnaire** (Appendices 4–7) with seven questions was sent out to Canadian and American design educators' to gather information from a broad range of design schools. This questionnaire was followed by nine **design educator interviews** (Appendices 8–10) to draw out more detailed information gathered in the questionnaire. Next, two hour-long **student workshops** (Appendices 11–19) were conducted. These were structured to compare the students' ideation methods and to gather the students' views and reflections regarding the differences. Each workshop concluded with a short questionnaire asking the students about their experiences in the workshop (Appendices 14 and 18). Finally, **student interviews** (Appendices 20 and 21) with six University of Alberta Visual Communication Design students, at various levels in their design education, were held to draw out more detailed information gathered in the questionnaire. Collated results with representative responses, where appropriate, are included in the discussion of each research component. Full and selected comment listings and results are included in the appendices (interview transcriptions include only portions relevant to this research).

To present a comprehensive perspective on sketching and ideation, input from both design educators and design students was essential to inform both the research and the conclusions drawn from this research. Speaking with design educators helped to frame the structure of the workshops by providing the approaches and directed conceptual development, if any, of other instructors. As well, learning how they may have encouraged conceptual exploration in their students, and learning about their views on the influence of digital technology to design education. In the workshops, analyzing the typical ideation methods of students to the challenges presented to them, how digital technology fit into this portion of their design process, and how this might affect their conceptual exploration, guided the overall approach.

4.2 Indicator Poll

In January of 2010 an indicator poll with two *yes* or *no* questions (Appendices 2 and 3) was emailed to design educators to find out if they had experienced a reduced student engagement in sketching and the use of the traditional sketchbook. Fifteen design educators replied from the 41 emails sent out, representing a 37% response rate. One response was disregarded as the respondent instructed a drawing and illustration class and only feedback from design or typography instructors was desired. The totals indicated here represent fourteen valid responses.

Ten of the 14 responses confirmed that they were assigning sketching and the use of a sketchbook, or some semblance of a sketchbook, as part of their teaching. Of these 10 responses:

- 5 indicated they believed the use of the sketchbook was well utilized
- 5 responses were mixed, with a yes and no response

Some responses were simply either *yes* or *no*; some were accompanied by a short elaboration. Interesting to note was that 3 of the responses mentioned that they thought their students did sketching after the fact to satisfy the requirements of the course or assignment.

4.2.1 Indicator poll compiled results (14 total)

1. Do you utilize a design journal or sketchbook as part of your teaching?
 - 10 - yes
 - 3 - no
 - 1 - inconclusive/unclear

2. Do you feel your students make effective use of this as part of their design education?
 - 5 - yes
 - 0 - no
 - 5 - yes/no
 - 1 - inconclusive/unclear
 - 3 - do not use sketchbook in teaching

An acknowledgement regarding the class requirement of sketching and the level of student engagement from other design educators affirmed the need for a broader questionnaire directed at design educators to analyze how the requirement was incorporated into design classes and what the expectations of it were.

4.3 Design Educator Questionnaire

The results from the indicator poll validated that there was a need to explore further. In April of 2010 an email questionnaire with seven questions (Appendix 6) was

sent to 121 visual communication design educators teaching within Canadian and American design programs. The recipients were chosen through an internet search to represent educators who taught specifically graphic design and/or typography. From 121 questionnaires sent out, 18 responses were received representing an 15% response rate. The following are representative responses to two questions from the questionnaire. A full collation of responses, is found in Appendix 7.

Selected responses:

Why do you request students maintain a sketchbook, notebook, or design journal?

The responses received from the design educators were thoughtful, as expected. Generally, the comments from educators seemed concerned with establishing good working habits, emphasizing a process to solving the design challenges presented to their students in class, and encouraging a broad exploration and alternate explorative methods. Similar comments regarding the tactility, immediacy, and directness of working on paper, without the aid or involvement of digital technology, were later echoed in the interviews with the design students. From the design educator questionnaire, below are three representative comments:

...communicate the value of sketching and drawing in their design practice...sketching by hand can be a more immediate way of recording ideas and testing concepts.

An empty sketchbook feels like an empty head, devoid of any ideas, content just to rip things off. A full sketchbook, bursting at the seams, tattered, and dishevelled with use, feels like a productive idea factory.

...underline the importance of, and stimulate reflection and consideration of what constitutes their design.

Encouraging an explorative and open-ended search for design solutions slows down the process and allows it to be understood by the student as a distinct, deliberate, and an important part in the design process working toward the final solution design. This potential for reflective time during the exploration of visual solutions can possibly make the student more aware of the elements they have chosen to utilize, and how they are utilizing these elements. Exposure to, and the use of alternative processes, allows the student to think of digital media more as one of many tools at their disposal. In the questionnaire some educators cautioned the use of software as part of the ideation process, to ensure their students were aware and open to exploring a broad range of avenues toward solving the design issues presented to them. Below are four representative comments from the educators with regard to their request of a sketchbook:

...to encourage exploration, ideation, development and refinement before finishing on the computer.

...much easier for ideas to remain fluid and open in handmade form. In my experience ideas appear on paper quicker than sitting in front of a computer.

...ideas flow more freely without the constraints of a computer. Sketching is an enormously important design tool.

...sometimes when students focus too much on digital means of expression, they get caught up in the production of the work rather than in the concept itself.

The comment of the software having an impact on conceptual exploration was later reaffirmed in the student interviews. One student's comment made reference to getting caught up in the details of the design, or the function of the software, thereby losing consideration for the overall concept.

Selected Responses:

Do you feel your students perceive a value in maintaining the sketchbook?

The responses received in the questionnaire indicated a near balanced *yes* or *no* answer with regard to the perceived value by their students—educators believed some students' did, and some students did not perceive a value. These responses were received prior to the shift in research focus specifically on ideation and so, reflect strictly analogue work on paper. Selected comments follow from within each response:

4 responses - Yes, believed students do perceive a value

11 responses - Mixed, Yes and No

...students often don't see the relevancy...the ones who have adopted the process...often will do better work.

Better, not necessarily graphically, but better concepts, ...partly due to the fact they can ask more poignant questions that can inform their work.

...you can tell it's half-hearted, usually reverse-engineered after doing their digital work

3 responses - No, believed students did not perceive value

Most students just want to jump into the project and see the sketchbook and any ideation process as holding them back.... I have to work to

show them the benefits (... I use my own sketchbooks to illustrate my frustrations, searching, struggles and the successful final designs).

...they are doing it for a grade. It leads them to measuring academic success by counting pages, hours, etc. rather than...whether they are a better designer when they come out of a class than when they went in.

4.4 Design Educator Interviews

Interviews with the design educators, based on the email questionnaire, broadened in scope from seven to ten questions. In June and July of 2010, nine design educators from both Canadian and American visual communication design programs were interviewed, either face-to-face or through *Skype* (Appendices 8 -10). Six educators from the initial questionnaire were interviewed. More than question and answer, the questions formed the basis for a conversation providing an opportunity to look deeper into how much emphasis was being placed on the conceptual exploration of the students, and how this ideation was captured or recorded. Planned to last approximately 30 minutes, some interviews lasted well over an hour with enlightening forays into related topics. The intent with each of the interviews was to delve deeper into the questions posed in the email questionnaire. Comments from the email questionnaire were confirmed in the interviews with the addition of contextual details. The following are representative views and opinions from the design educators interviewed, organized thematically. Portions of individual interviews are transcribed in Appendix 10.

An underlying theme present in each of the interviews was that sketching was part of establishing a conceptual process in solving any design challenge as noted in the comments from the educators below:

...in the last number of years increasingly fewer...do find value—but the ones who do engage really see the benefit—they see the value, the efficiency of the process, as opposed to people who work only on the computer...

...it's really the development of logical steps, this recording helps them develop a good working process...it teaches them that not every step you take is necessarily forward.

...I ask for lists of words and writing...students find it challenging to write thoughts...difficult to slow down and really think through the issue...

There was an acknowledgment by educators that digital design technology and software had an impact on conceptual thinking by not being as “second nature” as paper in the thinking and ideation process, below are three representative comments:

...work [only] on the computer...lacks the lateral jumps unlike the sketch-book work with a pen, ..the computer at times encourages too much linear thinking...the sketchbook encourages the messy and unrefined...

...a vehicle to get their thoughts, ideas, words, and lists down, in whatever form...as technology really becomes part of them...they could be carrying around an ipad or something like that...right now cheapest and easiest is paper.

...drawings now more architectural [with tablet], less emotional, as in the past with drawings by hand. (this comment was related to Industrial Design)

References were made to the tactile nature of the sketchbook as a physical object (tattered and dishevelled) that seem at odds within a predominately digital design industry. One educator made a reference to the sketchbook as an artifact of experience, alluding to not only the physical aspect, but to an open ended explorative journey, with sketching acting as a record of this journey. That comment is below:

...makes me uncomfortable that we're losing hand work, my hope is...the transition to things like the ipad will somehow bring back the haptic into the electronic...that we will be moving things and touching things with our hands again, ...getting back to a more direct feel of things....

4.5 Student Workshops

4.5.1 Introduction

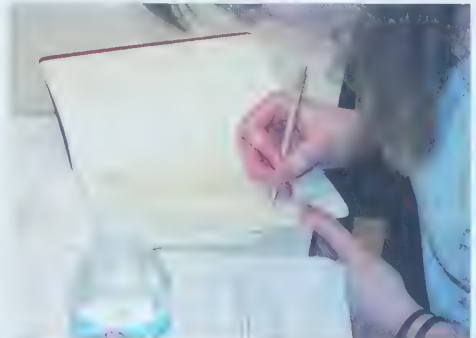
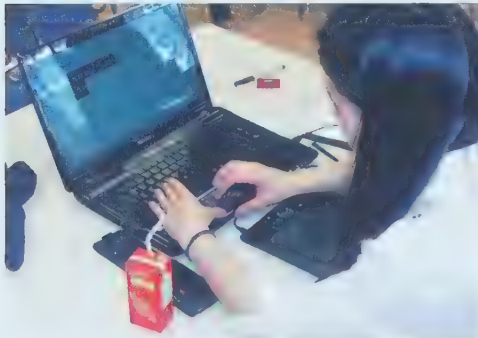
Two separate workshops were conducted with students. The first workshop in January of 2011 (Appendices 11–15), was presented in conjunction with a client for the creation of a poster to advertise an annual event. The second workshop in March of 2011 (Appendices 16–19), was with an advanced level design class in combination with the launch of a new project.

Both workshops were structured to last one hour and included two 25 minute sessions of ideation working either strictly digitally (through design software) or strictly analogue (pen or pencil on paper). Both workshops concluded with a short questionnaire asking about the students' experience not only in the workshop, but their typical habits when beginning any design project. Both workshops were with Visual Communication Design students at the University of Alberta and were structured to analyze and compare the ideation processes of the students.



Final poster produced from first ideation workshop.

Structuring a workshop to control the ideation method to either digital (design software) or analogue could help a student to be more aware of their personal approach and potentially the effectiveness of either approach or combination of approaches.



Students conceiving digitally (design software) and analogue during first ideation workshop.

Presenting the workshops at the introduction of a new problem was essential for capturing the students conceptual exploration in the initial stages. A questionnaire at the end of the one-hour session proved to be effective in obtaining frank and considered comments.

4.5.2 Comparing Ideation Methods - 1

Presented January 18, 2011 from noon to 1 pm, the first workshop was planned with the University of Alberta Museums and Collections Services who required a print and electronic poster to advertise an annual event. Open to all design students, the workshop was structured to last for one hour and was presented during the lunch hour to be open to the greatest number of students and conflict with the minimal number of scheduled classes (workshop outline, Appendix 12).



Critiquing poster submissions, first ideation workshop.

This workshop was promoted through notices in the Visual Communication Design area (p 62, Appendix 1) and visits to individual classes. At the start of the workshop, the client, Museums and Collections Services, described the event and defined their objectives for the poster and audience to which it would be directed. Students were then divided into two equal groups, with each group asked to begin their ideation toward a design solution using solely digital (design software) or analogue means. After 25 minutes the groups were asked to switch their ideation to the other method and encouraged to continue developing ideas and not to rework the same ideas in another medium. At the conclusion of the next 25-minute session the students were asked to complete a short questionnaire (Appendix 14) comparing their creative productivity between the two sessions as well as their normal ideation method in answer to any design brief (compiled results Appendix 15).

This session was attended by six students from all three levels of Visual Communication Design (second to fourth year students). Concept mock-ups were presented for client feedback in a group critique at the same time the following week, January 25. At the conclusion of this group critique the students were given a longer questionnaire regarding their conceptual work between the workshop and the group critique (questionnaire and compiled results, Appendices 14 and 15). Final poster submissions were six days later. Museums and Collections staff selected the poster (page 28) that was used for promoting the event from these submissions.

From the questionnaire following the workshop, all six participants noted that they thought they were more productive and produced more diverse solutions with analogue methods, whether it was their first or second concepting session; five stated it was because of the visualization method, sketching. With regard to their normal working method when beginning any design project, four of the six stated that their typical method for recording conceptual ideas was a balance between digital and analogue. Only one indicated beginning with analogue at the start of any design project.

A few representative comments from the questionnaire following the initial workshop (Appendix 15):

I can see my ideas quicker and adjust accordingly. [concepting on paper]

When I work I typically find that it's easier to generate more diverse idea[s] when sketching (by hand or on a program like Sketchbook Pro on the computer). The computer works better for refining ideas....



Second ideation workshop.

I find with sketching you don't necessarily need a clear image in mind—you can just try some-thing, see if it works then try something else. On the computer I get caught up in the bells and whistles...Thus getting stuck on things like font choice.

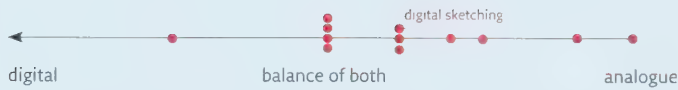
I feel it is too slow for me to get my ideas down while sketching. Digital ideation is too slow for me.

I find that there are more possibilities when sketching. It is easier to just start drawing your ideas. You don't have to worry about being competent at a program. With sketching you can explore typography in a more expressive manner. Sketching allows for better hand-eye coordination as well.

4.5.3 Comparing Ideation Methods - 2

The second student workshop (Appendices 16–19) was with an advanced Visual Communication Design class, delivered along with the introduction to a new class project. The workshop was structured with two 25-minute working sessions after a general introduction followed by a short questionnaire. The students were not divided into specific groups, but rather asked to begin their ideation process either digital (design software) or analogue, and to remain in the one medium for the duration of the session and then to switch to the other for the next 25 minute session. The majority of the students remained in the classroom during the two sessions of the workshop, though it was not a requirement. A short questionnaire (Appendix 18) was distributed following the end of the second 25 minute session. A number of responses are highlighted here (compiled results Appendix 19).

The first question was to indicate along a continuum where they typically begin capturing and/or visualizing their conceptual ideas. The compiled results were quite balanced between digital (design software) and paper with a tendency in most of the students to begin primarily with analogue methods/approaches. Only one of the twelve indicated somewhat of a preference toward beginning digitally.



Locating typical starting point for ideation of design projects in response to the post-workshop questionnaire.

The second question asked for an elaboration on the first, **Do you feel either is a more effective method at capturing/visualizing your conceptual ideas?** The comments elaborated on the distribution of the continuum:

...like both—like using found images to bounce images in my head and also sketching them out

...depending on the complexity of the final product sketching better to get ideas down if a digital version would be too complicated to produce

...digital is better for conceptualizing ideas based on repetition/computer generated graphics, pretty easy to visualize how it will look—sketching is better for experimenting with concepts

The survey, indicates that the decision of where to begin is driven more by considering the task at hand and leaning toward the most efficient working method than strictly falling into conditioned habits in the beginning stages of tackling a design project. Analogue ideation and sketching seemed reserved for more of the exploratory and brainstorming activities, with a move to the digital approach reserved more for refining and exploring a defined conceptual approach.

In response to the question, **Do you feel liberated or sometimes limited by technology when conceptualizing ideas digitally?** Comments included references to the level of detail and number of decisions required by the software which they were not prepared or comfortable to make early in the process, as well as the speed at which they can record and explore a variety of conceptual approaches. This would be related to a limitation of both knowledge and familiarity of the software and technology. Selected responses follow:

More often limited (by fonts, software...) better to have general idea to be visualized.

...often feel limited because of software knowledge—easier and faster by hand

...feel limited sometimes, makes concepts feel too contained...

...takes more effort to force software to do something out of the box—sketching almost the opposite problem, hard to refine but easy to capture mistakes

Prefer digital when focus on typographic elements rather than something without many details to communicate an idea.

...a bit of both—depends on task

...can be limiting in some ways and takes more time but is liberating when integrating type or color

...feel limited by technology sometimes—feel as though it is harder to master

...deciding what application to start, and just getting going is slow

Of the 12 participants 75%, 9 of 12, indicated they were more productive in their analogue methods of ideation; one stated they were more productive in their conceptual exploration working digitally; one indicated no apparent change in productivity between conceptualizing digitally (design software) or analogue; and one did not respond to the question.

All participants had taken a drawing class as part of their education. While 67% of the participants thought that the ability to draw was not necessary and rudimentary skills were adequate to capture and explore their conceptual ideas, 25% noted that having some drawing skills were helpful in the conceptual process. Select responses to the question, **Do you feel you need to be able to draw to be able to capture/record your conceptual ideas?** follow below.

No, sketching can be quite general and the final product does not always depend on its accuracy.

...drawing helps to capture 3D ideas...

No, simple symbols can represent a lot in the conceptual stages of a project.

...sometimes yes, it helps to be able to draw realistically when visualizing a future photograph or illustration

No, I tend to work very rough in sketches and move to digital for the transition to refinement.

...no, a rough sketch can generate great ideas; you don't need an elaborate drawing

Of the 12 participants in the workshop 58% or 7 of the 12 participants indicated that they maintained a sketchbook specifically in some iteration (either in book form or loose paper) for their visual exploration and ideation, two maintained what they considered more of a notebook than sketchbook. Two indicated they did not maintain a sketchbook and one did not elaborate on how/if they maintained a record of their ideation.

4.6 Student Interviews

In April 2011 six design students from various levels in their design education were interviewed (Appendices 20 and 21). The questions were directed to their personal habits for ideation, how and when they decided to work conceptually on paper or digitally (design software), and at what point they would normally introduce digital technology into their ideation process. The interviews allowed, as with the design educators, an opportunity to delve deeper, as well as provide a balance, to the research from the perspectives of both educator and student. Below are selected comments from the interviews referencing typical ideation methods (Appendix 21):

...definitely feel I think differently between software and paper

...working digitally you stop thinking about what your doing...less focused on getting an idea down than moving things around and placing things in just the right place

...concepts can be very rough to start with and then refined...with thumbnailing you are just purging ideas

I carry a sketchbook to record words and ideas...not relying on technology early in the process

...when I open Illustrator to begin a project I begin to worry about the micro details and not so much the bigger picture, staying on paper longer helps maintain the ideas and to focus to the big picture

I will start in technology if nothing is strongly defined...then technology is present from start to finish, but this is not my ideal working method

...like the idea of the flexibility that technology might offer, not for the sake of technology but the combining of sketch, image, hand drawing, together in one

4.7 Research Remarks

Soliciting the opinions of both students and design educators was important to presenting balanced and current perspectives on sketching and ideation. Opinions from design educators, though broad geographically, nevertheless represent a small sampling of quantitative information from which it is difficult to draw conclusive results. The student workshops and questionnaires also represent a small sampling of qualitative information. A combining and discussion of the results of both the primary and secondary research occurs in the next chapter, **Analysis** (5).

Note: After the questionnaire to design educators was distributed a progressive focusing from sketching and sketchbook to *ideation* began, influenced by secondary research. This questionnaire would otherwise have been structured to gather information specifically on analogue and digital ideation and the educators' opinions on this. The interviews with design educators solidified this shift to ideation with the conversations in many cases touching on the topic.

5. Analysis

Sketching is a sense making tool which supports the synthesis of visual imagery (Lane, Seery, and Gordon, 2010, p 71).

In synthesizing both primary and secondary research, three overriding themes come to the fore. The first, **The Ambiguous Nature of Sketching** (5.1), discusses the ambiguity of sketching as a strength early in the conceptual stages, specifically, how the inherent ambiguous nature of sketching can be an aid to the ideation process of designers because of the interpretive possibilities it allows and fosters, as well as how this ambiguity can be beneficial to both the designer and others to whom they may be communicating. Secondly, **Linear Logic and Lateral Leaps** (5.2), discusses how the linear logic of software can affect conceptual thinking and how the development of sketching as a tool can enrich the creative conceptual exploration unencumbered by the procedural and operational thinking that can accompany creative exploration through software, and how and when this can have an impact on the ideation process of students. Thirdly, **A Visual Record for Reflection** (5.3), discusses the importance of a visual record for reflection as part of gaining experience.

5.1 The Ambiguous Nature of Sketching

This section explores how ambiguity makes sketching an important tool for the conceptual development skills of design students and the role that reinterpretation of those sketches plays. When working through conceptual approaches to design problems the ambiguous nature of a sketch that lacks specifics and detail in the early conceptual design stage can be beneficial to a designer.

Comments from the post-workshop student questionnaires were forthcoming in describing their conceptual process. In many cases the comments from the student post-workshop questionnaires supported sketching as a way of thinking broadly and efficiently: “simple symbols can represent a lot in the conceptual stages of a project” and “it takes more effort to force software to do something out of the box—sketching almost the opposite problem, hard to refine but easy to capture mistakes” (Appendix 19).

Another comment from the student post-workshop questionnaires was poignant in their description of how starting with a loosely defined concept, sketching can further additional ideas through visualization to aid in the conceptual process. “I find with sketching you don’t necessarily need a clear image in mind—you can just try something, see if it works then try something else” (Appendix 15). An open-ended, visual notation to a design approach or idea, inherent to sketching, can be an aid to design students because of the potential multiple interpretations possible from one conceptual idea. Being open to multiple interpretations allows for the possibility of lateral leaps in the conceptual development of an idea with one loosely-formed idea leading to another, acting as an aid to and promoting visual invention and exploration.

As noted earlier, Mike Roy uses the analogy of the view from a plane at 40,000 feet where detail is not really possible, nor really desired. “The best descriptions are abstractions...at a more concrete level detail becomes not only more possible but much more useful” (2011). Roy’s allusion to the *concrete level* refers to the refinement of what the designer feels may be a viable approach to the design challenge, beyond the exploration of multiple broad approaches.

The ambiguous and interpretative qualities of sketching can benefit not only the creator, but also others to whom the designer may be attempting to communicate their conceptual approach. When critically evaluating the viability of a conceptual approach early in the design process, a concept presented in close to final form does not foster discussion of varied interpretations. The analysis can be limited to the specifics presented, without the leading possibilities of the more potentially open-ended interpretations inherent in sketching. These variations can also be easily and rapidly explored through sketching, possibly working into the existing visual. On the surface the concept can seem resolved because of this finished state—when in fact it does not fully address the intended design issue or may not resonate with the intended audience. Any designer, but specifically a student, can also become less subjective in evaluating a concept because of the time invested in the creation.

In a 2011 *Design Observer* interview, Jake and Pum Lefebvre speak about the advantages the ambiguity of sketching lends to the design process of their firm, Design Army. They refer to the use of sketching as a larger part of their working process where concept work for projects and concept presentations to clients are not produced on the computer. After a debriefing with the design team, individual members work through their own ideas in sketch form after which they come together for what they call a therapeutic strategy session, where they talk and sketch out all of their design ideas and filter through them to make sure they are valid and that they are really going to work for the solution they are trying to achieve for the client. The outcome in sketch form of this session is what they show to their clients, rather than a cleaned up and perfectly executed digital version. In the interview Pum is asked why she thinks it is important to sketch and why it is important to show sketches to their clients before doing any work on the computer. Her reply describes sketching as a type of dreaming, and how a

designer can see or dream a project coming to life in their head. To her, sketching can be just that—or it can be a list of words, or a combination of both, it is not only drawing. To Pum, the sketch is “from brain to hand” and “chemistry in your body, that’s how we get an idea down” (Millman 2011). Taking a sketch to the client, as opposed to showing finely detailed work at the conceptual stage, allows a greater opportunity to focus on the concept as idea.

Pum also outlines a fictitious scenario presenting a concept to a client where a blonde woman is used in a photograph representing a generic woman to be cast in the production process. The client, who does not like blondes, gets caught up with the fact that the woman is blonde. Pum explains that the concept may not be explored further because of this detail.

Professor Mark Avnet, Head of the Creative Technology track at the VCU Brandcentre, a graduate program in advertising, thinks everyone should utilize sketching. In his article “Reasons to Embrace Being Sketchy” he states “I believe all of us should sketch in our various media, in our thinking, and in our lives. Strategists should sketch; technologists, art directors, business people, copywriters, biz dev folk, and regular people should sketch” (Avnet 2010). In justifying his position he makes this statement about sketches, “For the most part, completed things can only be accepted or rejected. There’s no invitation to participate” (Avnet 2010). He elaborates:

Sketches though are loose, rough, and open to interpretation. They’re McLuhan-esque cool, requiring participation and involvement. There are blanks that the viewer needs to fill. The best execution is often the one that people have in their mind’s eye—and if you don’t give them room to imagine, they’re stuck with your vision instead. They can’t make it their own, and it’s harder for them to feel engaged. In fact, just think of how this carries over into consumer generated content—people feel engaged because they actually are engaged in the creation of something, not just nodding their heads or finding fault (Avnet 2010).

Avnet makes his general sweeping statement in an editorial within an employment listing web site. By advocating visual thinking, he provides a simple method to alter habitual thinking methods in a variety of areas, not only creative endeavors.

Almost in conflict with the rough and quickly sketched idea to visualize a conceptual approach, the refined nature of a finely crafted drawing does not provide flexibility for further interpretation.

5.1.1 Drawing Ability

A command of masterful drawing skills, to render an accurate perspective or likeness is not crucial to creative concepting or ideation. It is the notation of a concept that is the important aspect. As noted earlier, a minimal notation can carry a significant amount

of information. Although all of the students who participated in the workshops had taken a drawing class as part of their university education only 25% of these students believed that having some drawing skills were helpful in the conceptual process. Fifty percent of the students in the post-workshop questionnaire indicated that the ability to draw was not necessary and that rudimentary skills were adequate to capture and explore their conceptual ideas. Comments from the student post-workshop questionnaires reflect the opinions of the students with regard to the skill level required for sketching concepts, “sketching can be quite general and the final product does not always depend on its accuracy”; “simple symbols can represent a lot in the conceptual stages of a project” and a “rough sketch can generate great ideas; you don’t need an elaborate drawing” (Appendices 15 and 19).

The strength of sketching for conceptual exploration in design lies in the inherent nature of ambiguity in sketching, and the speed and ease with which many approaches to one idea can be visualized. The interpretive qualities of this visualization can foster additional concepts through lateral leaps of free flowing thought. Skillful drawing is not a requirement for this broad visualization.

5.2 Logic and Lateral Leaps

Sketching allows for visual exploration unencumbered by procedural and operational thinking that can accompany creative exploration through design software. By the nature of its structure, software may encourage thinking in logical steps, which can be counter-intuitive to conceptual exploration. Comments in the student post-workshop questionnaire mirrored comments from the educator interviews where both stated varying degrees of impact they believe software can have on ideation.

Referring to digital technology in 1990, Fish and Scrivener stated that computer sketching programs inhibit the serendipity of conventional media (1990, p 117). This sentiment still has validity according to the opinion of some design students and educators. As this comment from a design educator makes reference:

Work [only] on the computer...lacks the lateral jumps unlike the sketch-book work with a pen, ..the computer at times encourages too much linear thinking...the sketchbook encourages the messy and unrefined (Appendix 10)

Note: In the student workshops comparing analogue and digital (software) conceptual development the type of digital interface was not specified as part this research. Students were allowed to work as they typically would on solving any design problem. Though utilized in some design disciplines, the use of digital tablets specifically was not included as part of this research as they are not commonly used for ideation for visual communication design.

5.2.1 Opinions of Students and Educators

Comments from both students and educators agreed that digital interfaces do have an impact on ideation to varying degrees. While roughly half of the students in the post-workshop student questionnaire indicated they did begin their ideation in both paper and digital (software) form, many students commented that ideation through software is not as efficient in terms of flexibility and ease as sketching by hand.

Three student comments from the student post-workshop questionnaires and interviews articulate this, “I can see my ideas quicker and adjust accordingly [conceiving on paper]”; “Digital ideation is too slow for me”; “I feel that software doesn’t understand how designers work in an intuitive, conceptual sort of way” and “I tend to work very rough in sketches and move to digital for the transition to refinement” (Appendix 21).

The post-workshop questionnaire to students included a question about whether they believed the use of digital technology in their ideation for the project was *liberating* or *limiting*. Student responses included references to the level of detail and number of decisions required by the software that they were not prepared or not comfortable making that early in the process. A common response related to the lack of speed at which they could explore a variety of conceptual approaches. Knowledge and familiarity with software and digital technology would help alleviate this issue, but even in very familiar software, when thinking shifts from *what* to *how*, mental energy is drawn from the creative process.

One comment from the post-workshop student questionnaire summed up numerous student comments, “sketching is quicker for exploring ideas in early stages, on the computer I get too focused on style, grid, and functions of the program....” (Appendix 21). Both students and educators commented that with ideation done digitally through software there is a danger of becoming more focused on the mechanics of the software and less focused on the creative task at hand. Two comments from the student post-workshop questionnaires sum up the sentiment of a number of comments from the same questionnaire, “sketching allows me to put down exactly what I want to do without worrying about technical aspects” and “often feel limited because of software knowledge, easier and faster by hand” (Appendix 21).

There was an acknowledgment by both educators and students that digital design technology and software was “not quite there yet” (comment from design educator interviews, Appendix 10) in terms of not having an impact on conceptual thinking. One comment from the design educator interviews describes the relationship from the perspective of the traditional sketchbook, “a vehicle to get their thoughts, ideas, words, and lists down, in whatever form...as technology really becomes part of them... they could be carrying around an iPad or something like that...right now cheapest and easiest is paper” (Appendix 10).

This lack of computer use as second nature in the thinking and ideation process was stated by one student specifically during an interview. He now sketches on paper for conceptual work after having created digital illustrations on the computer for many years before design school. The student found he worked broader conceptually when sketching by hand, but would shift to the computer as a way of forcing a change in the mode of thinking if hand sketching was not providing satisfactory results toward solving the design challenge, or a deadline was looming and he needed to be closer to the end product quickly, “I will start in technology if nothing [the concept] is strongly defined... but it’s not my ideal working method” (Appendix 21).

Working conceptually with colour and type was noted as a strength of digital ideation in the student interviews. The almost unlimited variations and subtle combinations that are possible as well as the level of detail possible when working with type specifically. This comment came from the user of the traditional sketchbook who is also very capable with computer software. He qualified the statement by saying that this strength was essentially after the broad conceptual approach was established on paper. Other comments by students from the post-workshop questionnaire include, “can be limiting in some ways and takes more time but is liberating when integrating type or color” and “prefer digital when focus on typographic elements rather than something without many details to communicate an idea” and “digital is better for conceptualizing ideas based on repetition/computer generated graphics, pretty easy to visualize how it will look—sketching is better for experimenting with concepts” (Appendix 21).

Influential British designer, Terence Conran, in an interview with Ben Jonson stated:

I think it is vital for any designer to roll their sleeves up and get heavily involved in the making process because it helps you get a deeper level of understanding about design and how it relates to the consumer ... To me design has, and always will be, about problem solving and making people’s lives easier and more comfortable ... While we must embrace computers, we must not become slaves to them—the best ideas always start with an HB pencil and a sheet of plain paper (from Jonson 2011).

From responses to the post-workshop questionnaires, students’ decisions of where to begin were driven more by considering the task at hand and choosing the most efficient working method than strictly falling into conditioned habits in the beginning stages of tackling a design project. Sketching seemed reserved for more of the exploratory and brainstorming activities, with a shift to digital methods reserved for refining and exploring a defined conceptual approach.

Seventy-five percent of the student participants in the workshops indicated they were more productive in their ideation through the use of sketching. The comments were balanced between paper and digital (software) ideation with a tendency in most of the students to begin with conceptualizing on paper because of the ease, flexibility, and efficiency with which they were able to visualize numerous conceptual approaches.

5.2.2 Digital Efficiencies

Looking at how computer-based tools might be more helpful in concept development, the research of Verstijnen and Hennessey studied the mental processes just before sketching.

In a 1998 paper, “Sketching and Creative Discovery,” Verstijnen and Hennessey looked at how to improve the efficiency of computer-based idea-creation tools in order to make them more helpful in the early phases of design. Their research looked at sketching behaviour and the mental processes occurring just prior to sketching and was based on the premise that the creative process makes significant use of visual thinking so there is a strong contribution from visual imagery. They state “since imagery plays an important role in the creative process, the limitations are to be found in imagery” (Verstijnen and Hennessey 1998, p 522). Recommendations for the development of digital sketching tools were that such tools must be intuitive, like pencil and paper, as well as have a “low threshold of accessibility” (Verstijnen and Hennessey 1998, p 542) by not requiring specialized knowledge and not exceeding the current level of expertise of the user if they are to replace pencil and paper. “Sketching is needed if the operations cannot be done with mental imagery alone, or if the operations are much easier to perform externally” (Verstijnen and Hennessey 1998, p 522). The conclusions of Verstijnen and Hennessey also point out that digital tools “must be helpful in excess of paper and pencil tools” (1998, p 542) by providing support and raising performance with the most difficult aspect, restructuring or the discovery of new information from something existing (discussed page 8). The often vague nature of sketching allows, as they describe, “perceptual creativity to flesh out a new structure. So a computer tool has either to support unspecified forms as input, or a flexible switching between various structural descriptions of the input after its creation” (Verstijnen and Hennessey 1998, p 543).

Dr. Terence Love of Curtin University, concluded in a 2006 paper regarding the relationship of professional design practice with creativity, quality improvement and the computer hardware and software used by designers: “computer systems that directly support professional practice act to inhibit creative outcomes and have an adverse effect on quality improvement in creating novel, innovative designs” (2006).

The comments of the students and educators interviewed agreed that current software and computer interfaces are not as efficient and intuitive for conceptualizing as paper and pencil. From the design educator interviews this speaks to a number of comments with regard to the value of sketching, “in the last number of years increasingly fewer... do find value—but the ones who do engage really see the benefit—they see the value, the efficiency of the process, as opposed to people who work only on the computer” (Appendix 10). Verstijnen and Hennessey conclude, to be valuable for conceptual development concepting software needs to be intuitive and allow for the vague nature of sketches. As identified by Jonson digital technology and software has improved:

Given the portability, connectivity, large touch screen and a range of apps (software), such as Evernote (for multimedia notes and voice recording), Ideate (for concept visualization), or Compendium (for managing and visually organizing personal or group digital information sources and then connect ideas to them), the iPad, or similar touchscreen devices, appears a versatile ideation tool (Jonson 2011, blogpost).

Students and educators in this study agreed that current software and computer interfaces are not as efficient and intuitive for conceptual development as sketching on paper. The research of Verstijnen and Hennessey concluded that in order to be more valuable for conceptual development, computer based tools needed an intuitive interface as well as to allow for the vagueness of sketching, a direction that technology has begun to move towards. The saving of multiple file versions can record the evolutionary process of a design, but does allow an ease of access for comparative reflection.

5.3 A Visual Record for Reflection

Traditionally a design education involved the use of sketching to capture the conceptual development and ideation of current projects, as well as to provide a record of inspirational work and ideation work from past projects. For a student this serves as an important resource for reflection and referencing. As a working professional it can be an important resource, but not as essential as it is to the development of design skills for a student.

One student indicated that he maintained a sketchbook, but that it was, “not drawing as much as lists of things.” He went on to say that this was a record of words and ideas for projects. One of the educators interviewed said that the “sketchbook becomes an easy and effective library where they [the students] can return to, easy to jot things down to remember.” He continued that students,

...did find it challenging to write down words, he wanted them to slow down and really think about what first comes to mind, and where would that lead? That could lead to a terrific solution. In the end they do see value in the exploration, as a way of starting and working through the problem to a stronger solution (Appendix 10).

Another educator indicated during the interview that he has his students create what he calls a process book for projects that includes all of the conceptual work for an individual project: sketches, brainstorming mock ups, and design rationale. He calls this an artifact of the focused thinking for that project (Appendix 10).

...sketches have the important function of assisting the mind to translate descriptive propositional information into depiction. (Fish 1990, p 118).

As part of the process and function of sketching, Fish highlights the importance of reflection and visual reference to foster additional concepts, “This depictive information may then be scanned by attentional processes to extract new and perhaps original descriptive information, which in turn can lead to new depiction” (1990, p 118). This conceptual process is similar to *reflection-in-action* as described by Donald Schön and the *combining* and *restructuring process* described by Verstijnen and Hennessey. The processes described here are more important to a student of design than to an experienced designer as shown in the 2006 study by Bilda, Gero, and Purcell (also discussed page 12) who considered whether sketching for expert architects was an essential activity as part of their conceptual design process. Contrary to the architects’ comments, a conclusion of the authors from the testing was that sketching was “not an essential activity for expert architects in the early phases of conceptual designing” (2006, p 587).

The experience the architects gained over the term of working professionally, and the training from their education to think through design issues by visualization and sketching, may have aided them in internalizing the conceptual development design stage. In their conclusion Bilda, Gero, and Purcell state that the use of sketching is a learned process from the architects’ design education where they “learn to think with drawings, develop their ideas and solve complex problems with them” (2006, p 587) and that architects use sketches until they become experts.

Without the experience through their professional practice, and having sketching established as a process in their education, this ability for internalization could be limited, as it may have been when the architects in the study started out as students. The retention and presentation of conceptual process sketches for reflection and discussion would be firmly engrained during their education. “Design education requires an intensive learning process through drawing, thus it is important to learn how to think with sketches” (Bilda et al. 2006, p 609). They qualify this statement by offering that the experts may have “reached a state where they could progress a design through thinking only” (Bilda et al. 2006, p 609).

Though sketching may not be vital to the conceptual skills of an expert, because of experience gained through a professional career, Bilda, Gero, and Purcell acknowledge the importance of sketching as part of learning— learning that occurs through reflection and discussion of sketches.

5.3.1 A Tactile Record

During the interviews with the design educators, references were made regarding the tactility, immediacy and directness of working on paper without the aid or involvement of design software. This tangible record becomes an archive for current and past projects.

This reference to the tattered, dishevelled nature of the physical object of a sketchbook seems at odds within the predominately digital design environment we are currently experiencing. Fifty-eight percent of the student participants in the workshops indicated that they maintained a sketchbook specifically for their visual exploration and ideation in some form, either as a book or as loose paper. Some students indicated they maintained what they considered more of a notebook than sketchbook.

Two comments from the design educator interviews are especially succinct in their description of the physical object: “the idea of a child grasping or understanding an idea or meaning; truly to grasp it as a physical object...sketching as a connection between the brain, hand, and heart” and “it makes me uncomfortable that we’re losing hand work, my hope is...the transition to things like the iPad will somehow bring back the haptic into the electronic...that we will be moving things and touching things with our hands again...getting back to a more direct feel of things” (Appendix 10). Another educator made reference to the sketchbook as an artifact of experience, alluding to not only the physical aspect, but to an open-ended explorative journey, with the sketches acting as a record of this journey. This tangible, physical evidence that could be created and/or stored either digitally or in the form of a sketchbook becomes the tangible evidence of creative exploration that is available for reflection or reference for current or future projects.

A record of current and past exploratory conceptual work in a design education can be a valuable tool to a student studying design. It can act not only as a record of creative exploration but also as an archive of inspiration for future projects.

5.4 Impact on Design Education

Sketching as a skill does not have the emphasis as a component of a design education that it has had in the past. Students acknowledge the efficiency of sketching and consider it a skill, yet half of the students who responded to the post-workshop questionnaire mixed their ideation between analogue and digital (software) methods.

...the skill of drawing is so low on the list of priorities in design education that people now have to be reminded that drawing is, after all, a fundamental element in the design activity. (Gray 1979, p 76).

Phil Gray’s 1979 comment was echoed in 2007 by Pam Schenk who acknowledged that it has become increasingly difficult to convince students that drawing and sketching were a useful skill to them (2007).

Comments from the design educator questionnaires and interviews were generally concerned with the educators’ desire to establish good working habits for their students by actively advocating the efficiency of sketching for ideation and encouraging broad creative exploration. A tangible reference allows the educator to see evidence of this

visual exploration and the evolution of the potential solutions and design approaches taken, as well as an important developmental tool and archive for the student for reflection and reference for current and future projects. By emphasizing a process for solving the design challenges they present to their students, educators are providing an adaptable tool for future design projects and building sound working habits.

Concern has been voiced about the reduced emphasis on drawing skills during broad conceptual thinking as part of design education. Echoing the experience of the design educators interviewed, Pam Schenk states “there is much evidence to show that, in spite of the benefits of the computer, drawing remains vital in a designer’s capacity to explore and express ideas” (2007). In this research, feedback from workshops and interviews with students acknowledged the efficiency and importance of hand sketching for ideation, although roughly half of the ideation was done using digital means.

In a 2005 study, Jonson found that students used less computing when compared to practitioners. Jonson surmised that a lack of computer experience may indicate a reasoning for this result. Paralleling the results from the post-workshop questionnaire, Jonson reports that even though sketching was not recorded as the primary conceptual tool, all students believed they would have liked to do more sketching and that they considered it a skill. Interestingly, practitioners also considered sketching a skill and were in favour of the teaching of drawing despite themselves doing relatively little sketching in their practice.

A study with 124 undergraduate students by Lane, Seery, and Gordon, from the University of Limerick in Ireland, looked at the development of freehand sketching as a support tool for visual synthesis and creative discovery during design-driven activities. It involved timed exercises over a four-week period with eight hours of classroom instruction. The sketching ability of all participants was measured pre- and post-instruction. The overall conclusion was that the process made “a notable effect on student’s ability to form, manipulate and synthesise visual information and communicate this through freehand sketching” (Lane et al. 2010, p 68).

Despite research demonstrating that sketching can be an effective aid to students for ideation, and is considered a skill by both practitioners and students, its place as part of a design education has eroded. Conclusions drawn from both the primary and secondary research follow in the **Drawing Conclusions** (6).

6. Drawing Conclusions

Initially I used to be from the Why use a pencil [school]? I can draw using the computer school of thought, but after years of working this way, I found that what I produced had a visual vocabulary that was limited and derivative. After moving back to working with a pencil (as one of the many other tools – camera, computer, knife etc) I found my visual vocabulary to be more open and the creative process a lot more enjoyable and fluid (anonymous response to Helfand 2006).

An argument for the practice of sketching for ideation is articulated in this confession from a professional designer in response to the Jessica Helfand, *Design Observer* article discussed in section 3.4. The need for creative exploration in answer to design issues is constant for a designer. By focusing on developing the foundation for a solid conceptual design process, a design education can better prepare students to be capable, effective, and responsible, better enabling them to bring innovative thinking to the design challenges they encounter.

Discussed in the **Context** (3.0), chapter of this paper, multiple studies have reinforced the value of drawing as part of a design education. Bilda, Giro, and Purcell in 2006 acknowledged the importance of sketching in a design education by learning to think with sketches and Pam Schenk places drawing at the “centre of the creative and developmental process of design” (2007, p 3).

Research (4.0) discussed the workshops presented for this research comparing the ideation methods of visual communication design students, and solicited information regarding their experience during the workshops. The student feedback from the post-workshop questionnaires confirmed that sketching was part of their regular working process and that they did see the value in the utilization of sketching as part of their ideation process.

Analysis (5.0), conveyed the importance of utilizing sketching as part of the conceptual process for students through salient, beneficial features: an inherent ambiguous nature that can help to foster further interpretation and reinterpretation of a concept; exploration unencumbered by procedural and operational thinking that can accompany creative exploration through design software; and the self-generating archive of

visualization that acts as evidence of exploration for discussion with others, as well as for reflection and inspiration for subsequent projects.

The argument put forth in this paper is for creating an unencumbered process through sketching to broaden and deepen creative exploration for design. One main conclusion from this study is that the utilization of sketching, as part of building basic design skills in the conceptual development process, can be applied with positive results to any design challenge. Individual designers will discover a working method that is most effective for themselves, but a solid conceptual development process, fostered through the process of sketching, and established in a graphic design education is an invaluable tool that can sustain a designer through a career.

In answer to the research question posed at the beginning of this paper, **Can the utilization of sketching for ideation aid the conceptual design thinking of a visual communication design student?** The conclusion of this research, as well as the secondary research presented as part of this argument, indicates that students can benefit from conceptual thinking through sketching. Equipped with the solid grounding of a conceptual process that can aid creative and innovative thinking, designers are enabled to meet design challenges more effectively.

7. Future Directions

Over the course of this study, research and ideas directly and peripherally related to sketching and ideation became apparent. While adding another dimension to this inquiry, they were beyond the scope of this discussion. Six potential topics for future research are briefly outlined in this section.

Teaching Ideation through Software A major component of the work of any designer is a knowledge and reliance on design software. The closing remarks of a paper by Stones and Cassidy makes reference to teaching ideation through software. They state, “software fluency (knowledge of software functions) is not the same as teaching how to design with software” (Stones and Cassidy 2010, p 458). Their research shows that “tool choice can have an impact on design thinking” and in terms of design education, if tool use and design thinking are thought of as independent, it “thus makes a case for the two areas becoming more strongly pedagogically linked” (Stones and Cassidy 2010, p 458).

Ideation Comparison Between a Graphic Tablet and Paper The use of a graphic tablet for visual communication design students and graphic designers is not typically part of their everyday working process. Verstijnen and Hennessey concluded that in order to be valuable for conceptual development, conceiving software needs to be intuitive and allow for the vague nature of sketching (1998, p 542). As software, apps, and tablet technology have become more intuitive, an analysis comparing sketching for ideation with a tablet to that with paper may prove it to be a useful tool for graphic designers to adopt into their conceptual process.

Problem-Focused vs. Solution-Focused In studying how design skills are acquired by architectural students, Bryan Lawson, an educator and architect, compared the problem-solving abilities of final year architecture and post-grad science students. In his paper he notes “Significantly different problem solving strategies...” (Lawson, p 59) and concludes that design students used mainly “what might be called a solution focusing strategy...” where they begin generating solutions without trying to fully understand the problem. While most science students used “what might be called a problem focusing strategy” where they analyze the problem before beginning to generate solutions (Lawson, p 66).

Conceptual Development Methods in Non-Design Disciplines Exploring the methods used by other creative disciplines in conceptual development and their possible parallel or applicability to design. Singer and songwriter Jeff Tweedy of Wilco, during an interview (Q, CBC Radio, 27 September 2011), explained how he uses grunts and noise to simulate words in material he is working on. Ben Jonson compares the conceptual sketch in design to improvisations in music and drama (2002, p 250).

Verbalisation The significance of words or verbalizing a concept, to help make sense or to explain a design concept was noted in several papers. The research of Jonson indicated that a significant mode of expression in ideation was through words "... words are the most common means of human communication, both in face-to-face and computer-mediated environments....words are fundamental not just to communication but to the process of thought itself" (2005, p 621).

Jonson stated that "verbalisation, on its own or in combination with other conceptual tools, emerged as the prime mover for getting things started and was the most used tool for externalizing 'Aha!' moments" (2005, p 621). Sketching and talking together is what Donald Schön (1985) describes as the *language of designing* where during talking about the design, the designer is reflecting.

Cognitive psychologist, Dietrich Dörner, described the value of verbalization within the design process as a picture-word cycle (1999, p 409). In this cycle by verbally describing and articulating a design concept to another person, unclear portions will become apparent. "Verbalisation helps in finding the weak parts of your ideas" (Dörner 1999, p 409). As part of this picture-word-cycle Dörner also argues that this re-phrasing of a design problem, even if the solution seems quite clear, can be valuable in altering your perception of the issue or solution. He states that "words evoke new and different images and therefore alter the original image" (Dörner 1999, p 410).

Necessity of Visualization for Experienced Designers A 2006 study by Bilda, Gero, and Purcell (noted on page 11) considered the necessity for visualization or sketching in the conceptual development stage for experienced architects. Replicating this study with experienced visual communication designers, testing could consider the need to sketch or visualize concepts during the early exploratory stage of a given project, comparing results with the same designers and different projects in two separate sessions. In one session the designers would be allowed to sketch and visualize. In separate session with a different project brief the designers would not be allowed to sketch and visualize.

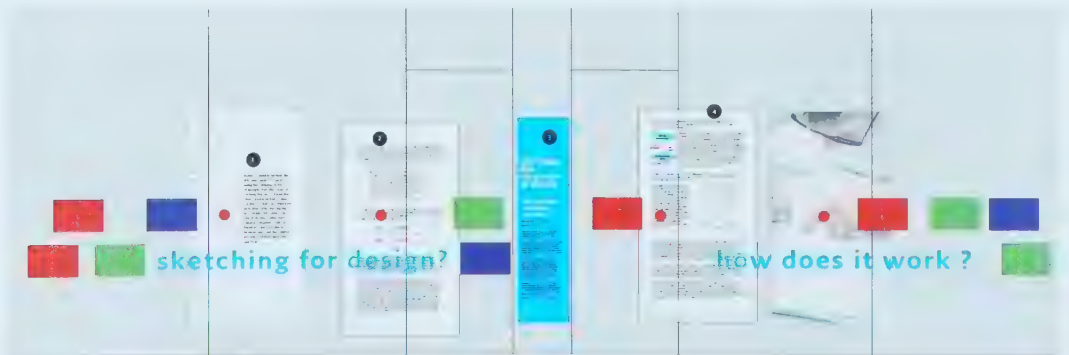
Teaching Ideation through Software, and Ideation Comparison Between a Graphic Tablet and Paper, could be timely additions to "sketching" and "ideation" as research topics because they acknowledge the pervasiveness of the digital environment and consider ways to take advantage of the positive aspects technology can offer the creative

process. Closely related to the efficiency of being able to quickly work through a number of conceptual approaches, *Verbalisation*, can be easily incorporated with sketching to further broaden conceptual thinking in a very simple manner in a way that designers are possibly naturally utilizing as part of their conceptual process.

Beyond the specific scope of this discussion on sketching, the topics identified above would lend a further analysis of the conceptual ideation process in design.

8. Public Exhibition

A presentation of the research discussed in this paper was exhibited in two side-by-side display cases within the Fine Arts Building on University of Alberta campus for seven days. Located in an area of the building busy with foot traffic, the cases are primarily viewed by passing traffic. The cases were designed to work independently with a central introductory panel (#3 in diagram below) between the two cases. A large anchor heading on the glass defined the theme for individual cases. The left-hand display case titled “sketching for design?” contained a text panel providing a definition of sketching and ideation (#2) along with a large image of sketches, words, and notes overlaid with a quotation relating to the strength of sketching leading to more diverse creative exploration (#1). The right-hand display case titled “how does it work?” contained a text panel describing how the process of sketching can work during the ideation process (#4) as well as an image of a student sketching with a laptop in the foreground. Both cases had quotes from the various sources of the primary research on 11x17 inch colour-coded panels across the front of the glass. The introductory panel invited viewers to leave comments directly on the glass with the dry-erase markers provided (indicated by red dots).

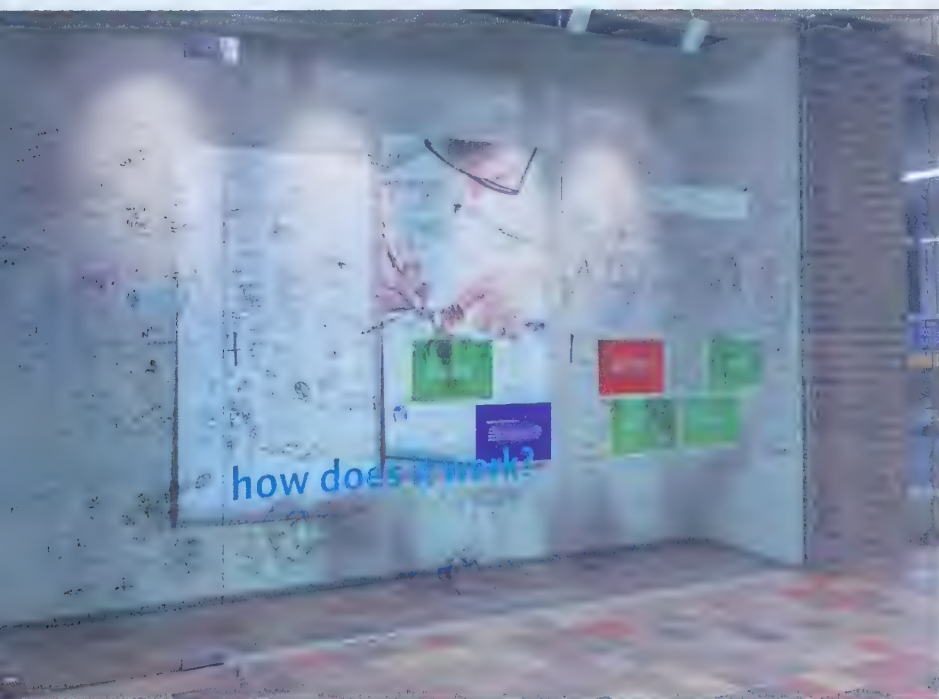


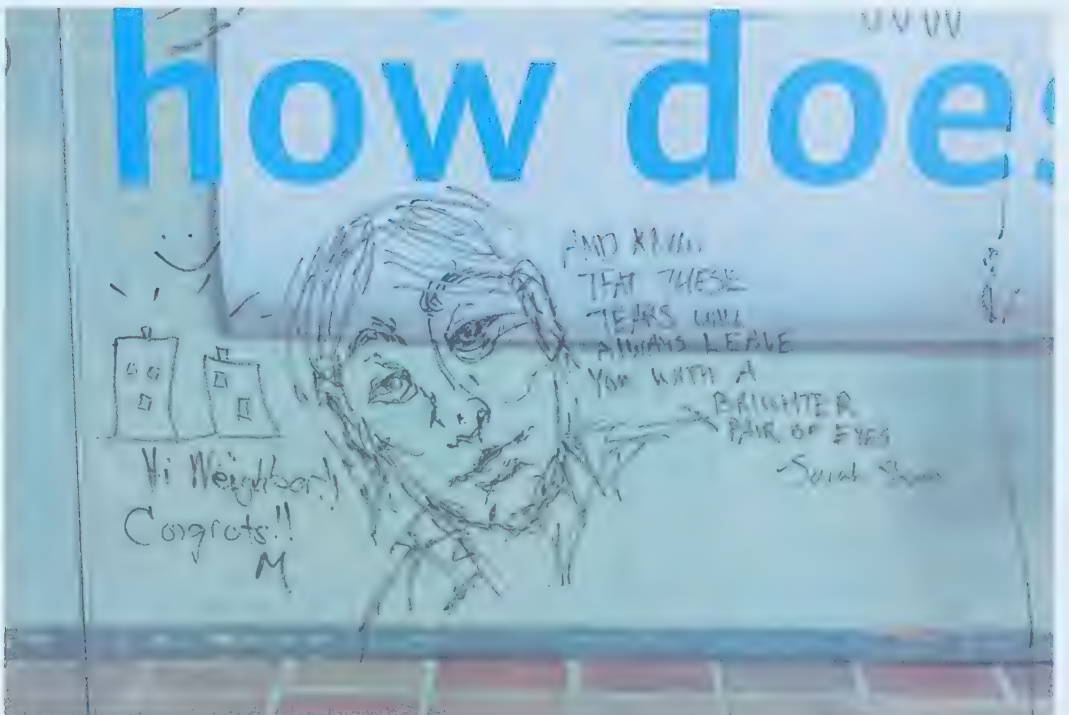
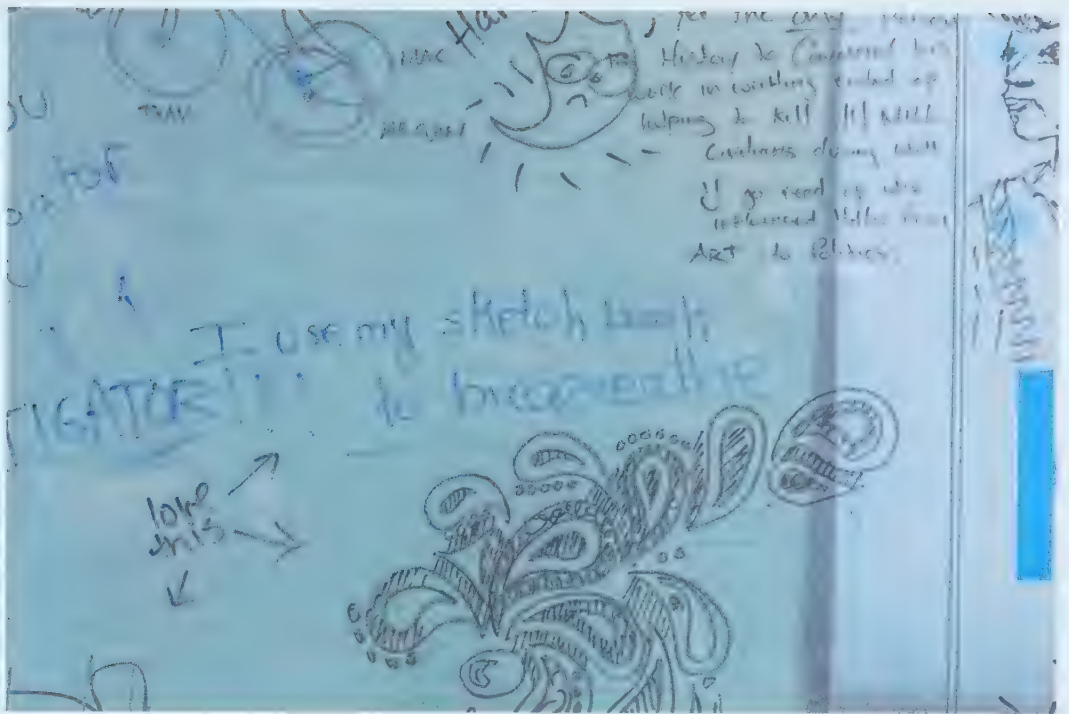
To scale planning diagram for public presentation.

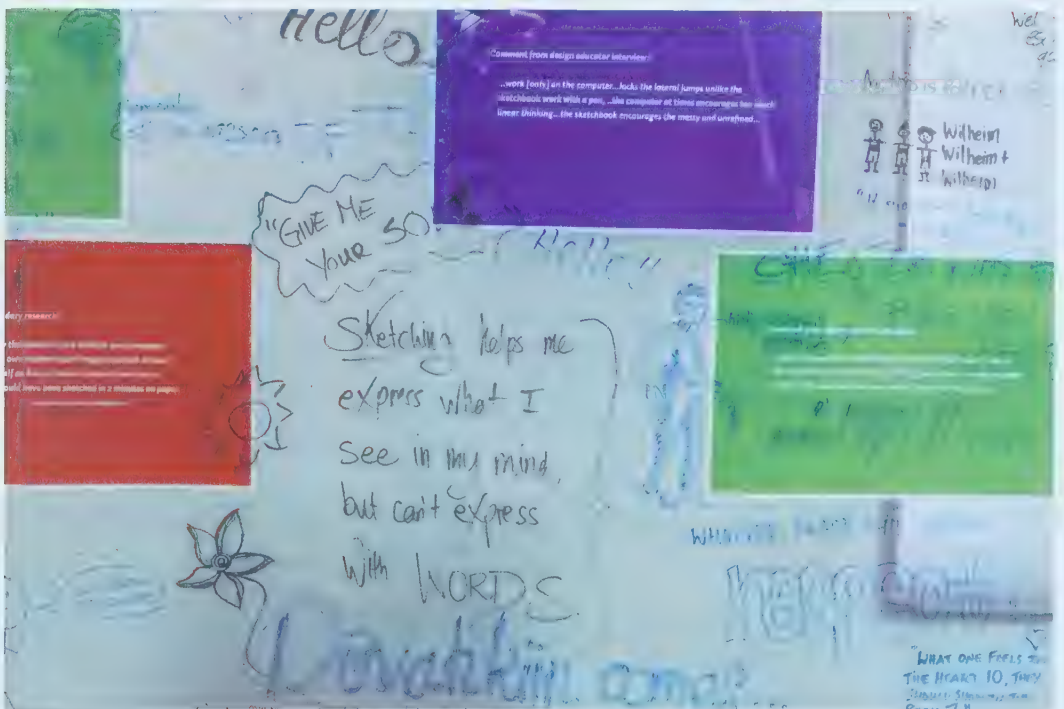
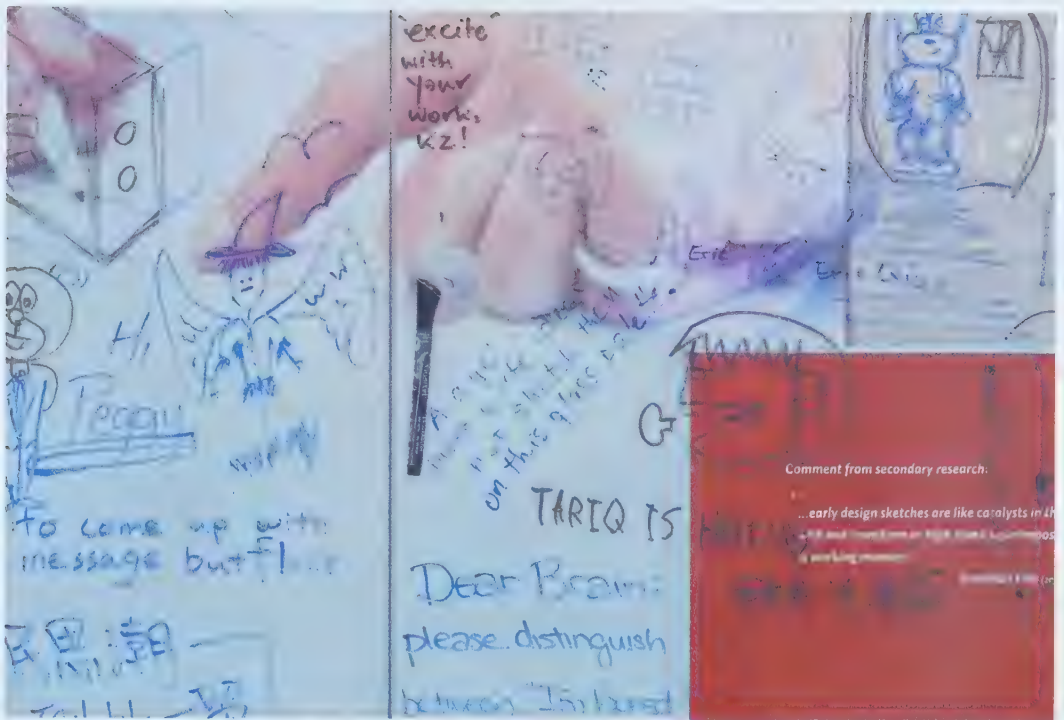
After the display was installed three comments for the glass were solicited to seed the invitation for comments on the glass of the display case. Over the next day, and through the period the display was installed, the glass window became an activated plane from floor to ceiling with some comments regarding the topic, as well as sketches, quotations, notes to fellow students, advertising for campus "safe walk," and a competition for the highest reach. Photographs of the exhibition are on the following three pages.

Note: Digital files documenting the exhibition are included on a dvd on the inside back cover.









9. Reference List

Airey, David. *Logo Design Love: A Guide to Creating Iconic Brand Identities*. Berkely, CA: New Riders, 2010.

Anderson, Rita E. and Helstrup, Tore. "Visual discovery in mind and on paper." *Memory and Cognition* Vol. 21 (1993): 283–93.

Apeloig, Philippe. "Interview 'e'" (New York, 2001, interviewer not defined). Accessed 10 November 2011. www.apeloig.com/studio.php?cle=04_Presse&cle2=29_2001_Apeloig_anglais.

Arnheim, Rudolf. "Sketching and the Psychology of Design." *Design Issues* Vol. 9, No. 2, Spring (1993): 15–19.

Avnet, Mark. "Reasons to Embrace Being Sketchy." *Talent Zoo*. Accessed 20 August 2012. www.talentzoo.com/news.php/Reasons-to-Embrace-Being-Sketchy/?articleID=7900.

Berger, Warren. *Glimmer: How design can transform your life, and maybe even the world*. New York: The Penguin Press, 2009.

Biederman, Irving. "Recognition-by-components: A theory of human image understanding." *Psychological Review*, Vol. 94, 2 (1987): 115–47.

Bilda, Zafer., Gero, John., and Purcell, Terry. "To sketch or not to sketch." *Design Studies* Vol. 27, No. 5 (2006): 587–613.

Brown, Sunni. "Doodlers, unite!" TED talks. Posted September 2011. Accessed 13 June 2012. www.ted.com/talks/lang/en/sunni_brown.html.

Boud, David., Keog, Rosemary., and Walker, David., eds. *Reflection: Turning Experience into Learning*. New York: Nicholas Publishing Company, 1985.

Dörner, Dietrich. "Approaching design thinking research." *Design Studies* Vol. 20, No. 5 (1999): 407–15.

Evans, Julie. "Coming Soon to Campus: The "New Free" Agent Learner, Are you Ready?" (presented at Campus Technology 09, Boston, Massachusetts, 27–30 July 2009). Accessed 29 August 2012. <http://www.tomorrow.org/speakup/ComingToCampus.html>

Fish, Jonathan. "Cognitive Catalysis: Sketches for a Time-lagged Brain." In *Design Representation*, edited by Gabriela Goldschmidt and William L. Porter. Springer, 151–84. London, 2004.

Fish, Jonathan., and Scrivener, Stephen. "Amplifying the Mind's Eye: Sketching and Visual Cognition." *Leonardo* Vol. 23, No. 1. (1990): 117–26.

Gardner, Steven. "Drawing and Designing: the Case for Reappraisal." *Journal of Art and Design Education* Vol. 9, No.1 (1990): 39

Goldschmidt, Gabriela. "The Backtalk of Self-Generated Sketches." *Design Issues* Vol. 19, No. 1 (2003): 72–88.

Goldschmidt, Gabriela. "The Dialectics of Sketching." *Creativity Research Journal* Vol. 4, No. 2 (1991): 123–43.

Grubbs, Christopher. "Drawing Life, Drawing Ideas." *Drawing/Thinking Confronting an Electronic Age*, Marc Treib, Ed. Routledge, London, New York, 2008.

Haas, Christina. "How the Writing Medium Shapes the Writing Process: Effects of Word Processing on Planning." *Research in the Teaching of English*, Vol. 23, No. 2 (1989): 181–207.

Helfand, Jessica. "The Art of Thinking through Making." *Design Observer*. Accessed 12 June 2012. <http://observatory.designobserver.com/entry.html?entry=4287>.

Ivanova, Anelia., and Smrikarov, Angel. "The New Generations of Students and the Future of e-Learning in Higher Education." (presented at International Conference on e-Learning and the Knowledge Society - eLearning '09). Accessed 16 August 2012. www.iit.bas.bg/esf/docs/publications/TheNewGenerationsStudentsFutureE-learningHigherEdu.pdf.

Jonson, Ben. 25 March 2011 (16:29) blog posting "iPad as ideation tool." Accessed 25 March 2011. <http://ideation-workshop.blogspot.com/2011/03/ipad-ideation-tool.html>

Jonson, Ben. Terence Conran interview "The Q&A: Terence Conran, Make things with your hands" in *The Economist*. Accessed 24 December 2011. www.economist.com/blogs/prospero/2011/12/qa-terence-conran

Jonson, Ben. "Capturing Design Ideas" *Journal of Design & Technology Education* Vol. 8, No. 1 (2003): 18–26.

Jonson, Ben. "Sketching Now." *International Journal of Art & Design Education* Vol. 21, No. 3 (2002): 246–53.

Jonson, Ben. "Design Ideation: the conceptual sketch in the digital age." *Design Studies* Vol. 26, No. 6 (2005): 613–24.

Kavakli, Manolya. "Sketching as Mental Image Processing." *Design Studies* Vol. 22, No. 4 (2001): 347–64.

Lane, Diarmaid., Seery, Niall., and Gordon, Seamus. "A Paradigm for Promoting Visual Synthesis through Freehand Sketching." *Design and Technology Education: An International Journal* 15.3 (2010): 68–90.

Lawson, Bryan R. "Cognitive Strategies in Architectural Design." *Ergonomics* Vol. 22, No. 1 (1979): 59–68.

Loewy, Andy. "Teaching Design Innovation: Methods For Promoting Innovation in the University Industrial Design Studio." (Originally presented at the National Collegiate Inventors and Innovators Alliance (NCIIA) 12th Annual Meeting in 2008, republished with permission of NCIIA.) Accessed 13 June 2012. www.icsid.org/education/education/articles736.htm.

Love, Terence. A Systems Analysis of the Problems of Professional Practice in Design: "Why Mac Computer Systems Reduce Creativity and Inhibit Quality Improvement of Novel Innovative Design." Accessed 20 August 2012. http://www.love.com.au/PublicationsTLminisite/2006/prob_profprac.htm

Maria, Jason S. Posted 22 April 2009, "Pretty Sketchy." Accessed 20 June 2011. <http://v4.jasonsantamaria.com/articles/pretty-sketchy/>.

Millman, Debbie. "Design Army." Design Matters podcast interview with Jake and Pum Lefebure, *Design Observer*. Accessed 11 Feb 2012. <http://observermedia.designobserver.com/audio/design-army/30288/>.

Prensky, Marc. "Digital Natives, Digital Immigrants." Accessed online 10 June 2012. www.marcprensky.com/writing/prensky%20-%20digital%20natives,%20digital%20immigrants%20-%20part1.pdf. Originally published in *From On the Horizon*. MCB University Press, Vol. 9 No. 5, October 2001.

Roy, Mike. "Drawing and Design." *Formation*, IIT Institute of Design. Video posted 15 August 2011. Accessed 22 October 2011. https://formation.wallst.com/articles/2011/drawing_and_design_iit_institute_design.

Schenk, Pam. "A Letter from the Front Line." Originally published in *Tracey: What is Drawing For?* October 2007. Accessed 11 November 2011. http://www.lboro.ac.uk/departments/sota/tracey/journal/widf/images/Pam_Schenk.pdf.

Schenk, Pam. "Developing a Taxonomy on Drawing for Design" (presented at the IASDR07 International Association of Societies of Design Research at the Hong Kong Polytechnic University, November 12–15, 2007). Accessed 20 August 2012. www.sd.polyu.edu.hk/iasdr/proceeding/papers/Developing%20a%20Taxonomy%20on%20Drawing%20in%20Design.pdf

Schenk, Pam. "The Why and How of Drawing: A 20 year shift in design procedures and priorities," *Proceedings of the European Academy of Design Conference*, Bremen, Germany, 2005. Accessed 23 September 2012. http://ead.verhaag.net/fullpapers/ead06_id221_2.pdf

Schenk, Pam. "The changing role of drawing with specific reference to the graphic design process" (presented at DATER 1991 Conference, Loughborough, Loughborough University). <https://dspace.lboro.ac.uk/dspace-jspui/handle/2134/1632>.

Schön, Donald. *The Design Studio: An Exploration of its Traditions and Potentials*. RIBA Publications Limited, London. Accessed 20 August 2012. www.scribd.com/doc/72475053/Books-The-Design-Studio-by-Donald-Schon.

Schön, Donald. *The Reflective Practitioner: How Professionals Think in Action*. Basic Books, Inc. USA (1983).

Stones, Catherine., and Cassidy, Tom. "Seeing and discovering: how do student designers reinterpret sketches and digital marks during graphic design ideation?" *Design Studies* Vol 31 Issue 5 (2010): 439–60.

Suwa, Masaki., and Tversky, Barbara. "External Representations Contribute to the Dynamic Construction of Ideas." Accessed online 12 June 2012. <http://www-psych.stanford.edu/~bt/diagrams/papers/suwatverskydiagrams02.pdf>.

Tohidi, Maryam., Buxton, William., Baecker, Ronald., and Sellen, Abigail. "User Sketches: A Quick, Inexpensive, and Effective way to Elicit More Reflective User Feedback" (paper delivered at NordiCHI 2006: Changing Roles, 14–18 October 2006, Oslo, Norway). Accessed 20 August 2012. <http://research.microsoft.com/en-us/um/people/asellen/publications/p105-tohidi.pdf>

Tucker, Lisa. "Frank Lloyd and the Design Process" (paper presented at the IDEC 2012 Annual Conference, March 19–22, 2012. Baltimore, MD). Accessed online 22 August 2012). <http://2012.idec.org/frank-lloyd-wright-and-the-design-process>.

Tversky, Barbara. "What Does Drawing Reveal about Thinking?" Stanford University. Accessed online 12 June 2012. <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.89.8835>.

Tversky, Barbara. "What Do Sketches say about Thinking?" Stanford University. Accessed online 12 June 2012. <http://psych.stanford.edu/~bt/diagrams/papers/sketchingaaai02format.doc.pdf>

Ullman, David., Wood, Stephen., and Craig, David. "The Importance of Drawing in the Mechanical Design Process." Accessed 20 August 2012. <http://www.informatics.sussex.ac.uk/courses/ModDis/Internal/Ullman.pdf>.

Verstijnen, I.M., and Hennessey, J.M. "Sketching and Creative Discovery." *Design Studies*, 19 (1998): 519–46.

Zubryn, Alex. "Drawing, design, and the digital dilemma" (research poster presented at aglIdeas 2011 International Design Research Lab, 2 May 2011. Part of the aglIdeas 2011 International Design Week, Melbourne, Australia). Accessed online 11 June 2012. http://iridescent.icograda.org/2011/04/29/drawing_design_and_the_digital_dilemma.php.

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Appendix 1

University of Alberta Ethics Application

KEVIN ZAK ETHICS APPLICATION • FEBRUARY 2010

University of Alberta
Faculty of Arts, Science & Law, Research Ethics Board

APPLICATION TO CONDUCT RESEARCH INVOLVING HUMAN PARTICIPANTS

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Project Title

Can the use of a sketchbook play an effective role in the education of a visual communication design student?

Funding Source(s)

None

CAN THE USE OF A SKETCHBOOK PLAY AN EFFECTIVE ROLE IN THE EDUCATION OF A VISUAL COMMUNICATION DESIGN STUDENT?

Summary

This research will look at a way visual communication design is taught beyond defined projects. Specifically the use of, and student engagement in, a traditional or digital 'sketchbook' or 'design journal' during the foundation years (first and second years) of a visual communication design education.

The use of a sketchbook or design journal can provide:

- **a record of the design process;** the exploration, development, and reflection of various conceptual approaches and ideas during the creative process; a process of turning experience into learning Boud, Keogh, and Walker (1985) described reflection as "those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations."¹
- **a visual and/or written discourse/dialogue with oneself;** a record of an individual's thinking (individual thinking) through of a problem and development of ideas. Pam Locker (2009) makes reference to the importance of drawing skills to designers: "Despite huge advances in technology, drawing remains the quickest and most effective means of communicating ideas from our imagination."² The inclusion of a notation along with inspirational or influential pieces of design placed within the journal can help clarify the designers own thoughts and the subsequent communication to others.
- **a repository of visual research;** a collection of visuals or concepts that are inspirational or influential to the individual, either in general terms or related to specific projects. As this collection matures and develops it can also act as a reference or resource for future projects or as a visual reminder of design encountered in the past;
- **a documentation of design analysis;** a written documentation of critical analysis of both their own and the work of others they are inspired or influenced by. These 'notations' also help with the articulation and communication of this critical analysis to others;
- **a bridge between school projects and the 'real world' of design;** to emphasize in the design process a connection between what students are learning in the classroom with the varied cultural, political, and technological experiences that they are experiencing outside of it Katie Salen (1998) proposes to conceive of research as "more than a method of collection – into the realm of connection and creative endeavor."³ Salen describes "a 'wander-ground' between here and there..." similar to defining travel as exploration and a transforming encounter;
- **a design task of personal expression itself;** the physical form or 'book' can be very individual, designed to express the personality of the user. Traditionally the sketchbook or design journal has been a bound book of any size deemed most convenient by the creator. It can be of a more generous format or a smaller and easier format to handle and carry around; being less obtrusive when sketching or making note of something in a public space. By virtue of being bound it provided a ready made ordering of thought and process. A digital repository on a laptop can act in very much the same way.

Research

This study will involve both senior (fourth year) and entry level (first and second year) visual communication design students, as well as visual communication design educators. The study will be divided into four parts:

- 1. A focus group with 12 to 15 senior design students, who are concluding their undergraduate Visual Communication Design studies at the U of A. I anticipate the focus group session will be approximately 30-45 minutes with six main questions (Appendix A).*
- 2. A focus group session with 12 to 15 University of Alberta design major students currently enrolled in DES 139, Design Fundamentals (this group represents the first year of study). I anticipate the focus group session will be approximately 30 minutes with six main questions (Appendix B).*
- 3. A survey/questionnaire of approximately 7 main questions to approximately 50 Canadian and American visual communication design educators (Appendix C). This will be sent via email and will solicit short answers to questions regarding use of a sketchbook/design journal in their teaching.*
- 4. An approximately 45 minute face-to-face or telephone interview with approximately six design educators (Appendix D). The structure and questions will be somewhat similar to the questionnaire (Appendix C) but the answers will hopefully be lengthier and provide more insight.*

Assessment of Risk to Human Participants

Data will be collected in all four parts of the research. Both focus group sessions (Parts 1 and 2) will be audio recorded, transcribed, and coded for anonymity. The interviews (Part 4) will be audio recorded, transcribed, and coded for anonymity. I will take written notes during all sessions. Each participant for the focus groups and interviews will have agreed in writing (Appendix E and F). The responses to the email survey (Part 3) will be tallied and the emails retained as a digital record. It will be clearly outlined that a response to the email survey will indicate the respondents permission for me to use the data they provide anonymously for my research. In total, I am anticipating to speak with and collect information from approximately 30 visual communication design students and approximately 26 visual communication design educators. The risk associated with participation in this study is considered minimal.

Description of Procedures Undertaken to Reduce Risk to Human Participants

All participants will be informed that participation is voluntary and that they may leave at any time without penalty. Each participant will be informed about the purpose and nature of the research and ask to sign a consent form (Appendix E and F) if they wish to participate as well as ask questions about the research before they sign the consent form.

Students will not be coerced in any way to participate in this study. Students will be told that participation will be voluntary, and not associated with any of their classes, grades, or any other evaluation associated with their program. Instructors will not be told which of their students have taken part in the study. Students must be at least 18 years old to be eligible

to participate. Information will not be collected from students registered in any of the classes that I am instructor for.

Participant recruitment

Senior student participants

Recruitment will involve a poster advertisement (Appendix G) placed in the common areas of the Visual Communication Design area of the Fine Arts Building. With permission of the instructors I will also make a brief announcement in the senior level design classes. The poster and announcement will describe the research, request volunteers, outline eligible participants, define the time and place of the focus group, and provide contact information.

First and second year student participants

Recruitment will involve permission of the instructors responsible for the Design Visual Fundamentals class(es) and an announcement within the class(es) prior to the date of the focus group. The announcement will describe the research, request volunteers, outline eligible participants, define the timing (beginning and conclusion of the course), the specific time and place of the focus group, and provide contact information.

Email participants

Recruitment will be via email (Appendix H) directed to specific individuals who are Visual Communication Design educators at a post-secondary level in either a university or college setting within Canada or selected equivalent American schools of design. The body of the email will describe the research, define the nature and anonymity of the survey, and provide contact information. The survey itself will be an attachment to the email.

Interview participants

Recruitment will be via an introductory email (Appendix I), telephone, or in-person invitation directed to specific individuals who are Visual Communication Design educators at a post-secondary level in either a university or college setting within Canada or American schools of design. The body of the email will describe the research, define the nature and anonymity of the survey, and provide contact information if there are any questions. The survey itself will be an attachment to the email.

Data collection and privacy information

Focus groups and interviews will be audio recorded, transcribed, and individual responders coded for anonymity.

As the nature of focus groups requires work with a number of people together, complete anonymity is not possible. However, all participants will be asked not to share the content of other's comments outside the focus group meeting. All data and personal information the participants provide will be considered completely confidential. The participants identities will remain anonymous.

The data collected as part of this research will be used in an MDes thesis report. Data will be handled in compliance with the University of Alberta Standards for the Protection of Human Research Participants. All interview data, including audio files, transcripts, and written notes will be kept in a secure location for a period of five years beyond completion.

Detailed Research

This research stems from my own experience with teaching visual communication design students and a generally low engagement with the use of a 'sketchbook' or 'design journal' beyond a small number of students per class. Despite encouraging reminders, bringing in a sample, and speaking about the various forms that a sketchbook or design journal might take, the engagement remained low. The word 'sketch' lends a perception that it was a venue for 'sketching/drawing' as required in other fine arts courses which the student may be taking during the same period and possibly perceived as valueless because of this. A 'rebranding' (so to speak) to 'design journal' and away from being a 'sketch' book was not successful in increasing engagement.

Conversations with other visual communication design educators affirms that it is common practice to request that students maintain a 'sketchbook' or 'design journal' (in whatever form) during the period of a class. The general conclusion is that they are felt to be under utilized.

This study will involve both senior and entry level visual communication design students, as well as visual communication design educators. The study will be divided into four parts:

1. A focus group with 12 to 15 senior design students, who are concluding their undergraduate Visual Communication Design studies (Appendix A). I anticipate the focus group session will be approximately 30-45 minutes in length with six main questions. This will inform me of their observations with regard to 'sketchbooks' and/or 'design journals' as part of their design studies over the course of their approximate 4 years of study, the number of Visual Communication Design courses in which it was requested, the use of traditional and/or digital sketchbook, their feelings of validity and of use to them as a student of design, and any suggestions from them for improved effectiveness or possibilities of a substitution for the role of the traditional sketchbook. At the beginning of the session I will introduce them to my research and provide a definition and purpose of a sketchbook or design journal. As part of the introduction to the session (as well as distributing the informed consent) I will inform the students that their participation is voluntary, that the session will be audio recorded, that they may leave at any time without penalty, and that it is not associated with any of their classes, grades, or any other evaluation associated with their program. Instructors will not be told which of their students have taken part in the study.
Anticipated date: March–April 2010
2. A focus group session with 12 to 15 University of Alberta (design major) students currently enrolled in DES 139, Design Fundamentals. This focus group will be timed to occur very close to the conclusion of the course. I anticipate the focus group session will be approximately 30 minutes in length with six main questions (Appendix B). This will inform me of their observations with regard to 'sketchbooks' and/or 'design journals,' whether it was requested in their current class, the use of traditional and/or digital sketchbook, their feelings of validity and use to them as a student of design, and any suggestions from them for improved effectiveness or possibilities of a substitution for the role of the traditional sketchbook. At the beginning of the session I will introduce them to my research, provide a definition and purpose of a sketchbook or design journal, and show a sample of a design journal. As part of the introduction to the session (as well distributing the informed consent)

I will inform the students that their participation is voluntary, that the session will be audio recorded, that they may leave at any time without penalty, and that it is not associated with any of their classes, grades, or any other evaluation associated with their program. Instructors will not be told which of their students have taken part in the study.
Anticipated date: March–April 2010

3. A survey/questionnaire of approximately 10 questions to approximately 50 Canadian and American visual communication design educators (Appendix C). This will be sent via email and will solicit short answers regarding the use of a sketchbook and/or design journal in their teaching: do they ask students to maintain one during the course of the design classes they teach, do they feel it is effectively utilized by their students, do they feel it is of value to their students? Accepting the nature of a mass email and the time requested in responding I am realistically expecting a 40% response rate, or approximately 20 respondents. As an incentive to solicit additional responses I plan to share the results of this survey with all respondents. Respondents will have the option of submitting either a paper copy via fax or digitally via email.
Anticipated date: April 2010
4. An approximately 45 minute face-to-face or telephone interview with six visual communication design educators, both at the University of Alberta as well as other post-secondary institutions offering equivalent visual communication design degrees (Appendix D). The structure and questions will be somewhat similar to the questionnaire (Appendix C) but I am anticipating the answers to be lengthier and to provide more insight as well as experiences at other institutions. The individuals interviewed will not have participated in the email survey.
Anticipated date: May 2010

Notes

1. Boud, D., Keogh, R., and Walker, D. "Promoting Reflection in Learning: A Model." In D. Boud, R. Keogh, and D. Walker (eds.), *Reflection: Turning Experience into Learning*. East Brunswick, N.J.: Nichols, 1985.
- Locker, Pam, Transcribed from "Keeping a Sketchbook," *Pencils and Pixels*, University of Lincoln, UK <http://pencilsandpixels.blogs.lincoln.ac.uk>. Accessed 22 January 2010
3. Salen, Katie, "Traversing the Edge and Centre: A Spatial Approach to Design Research." *The Education of a Graphic Designer*, ed. Steven Heller, 1998. Allworth Press, NY

APPENDIX A

FOCUS GROUP QUESTIONS FOR SENIOR VISUAL COMMUNICATION DESIGN STUDENTS

1. Was the use of a sketchbook or design journal (traditional or digital) assigned in any of your visual communication design classes?
 - Did you decide what form it took or was the form defined for you?
 - Was it digital? traditional?
 - Did you maintain it only for the grade?
2. Was the purpose for doing a sketchbook and/or design journal, and what was expected to be included within it, clear to you?
 - Describe how you used the sketchbook/what you did in the sketchbook.
 - At the time, did you feel you utilized it well?
 - If you didn't use it, why not?
3. Did you and/or do you perceive a value in using a sketchbook or design journal?
 - Have you retained, or will you retain, any of your sketchbooks?
 - Have you continued to use a sketchbook or design journal outside of a structured design class?
 - When you begin conceptualizing a design solution where do you begin, on paper or screen?
4. Can you think of another way that the role or function of a sketchbook or design journal as I have defined it might be accomplished?
 - Would you like to have directed tasks that you can personalize?
 - Would you like to have a defined set of exercises related to a current class assignment?
5. Do you have a collection of stuff (objects, design) that is either influential or inspirational?
6. Have the questions and discussion today made you rethink, in any way, maintaining a visual record of your working process and/or collecting artifacts of design?

APPENDIX B

FOCUS GROUP QUESTIONS FOR FOUNDATION YEAR VISUAL COMMUNICATION DESIGN STUDENTS

1. Was the use of a sketchbook assigned for this class?
 - Did you decide what form it took or was the form defined for you?
 - Was it digital? traditional?
2. Was the purpose for doing a sketchbook and/or design journal, and what was expected to be included within it, clear to you?
 - Describe how you used the sketchbook/what you did in the sketchbook.
 - Do you feel you utilized it well?
 - Did you maintain it only for the grade?
 - If you didn't maintain it, why not?
3. Did you and/or do you perceive a value in using a sketchbook or design journal?
 - What was the value?
 - Will you retain the sketchbook created for this course?
 - Will you continue to use a sketchbook or design journal outside of a structured design class?
4. Can you think of another way that the function of a sketchbook or design journal, as I have defined it, might be accomplished?
 - Would you like to have directed tasks that you can personalize?
 - Would you like to have a defined set of exercises related to a current class assignment?
5. Do you have a collection of stuff (objects, design) that is either influential or inspirational?
6. Have the questions and discussion today made you rethink, in any way, maintaining a visual record of your working process and/or collecting artifacts of design?

APPENDIX C

SURVEY QUESTIONNAIRE TO DESIGN EDUCATORS

1. *Do you ask that students maintain a sketchbook, notebook, or design journal during the period of the visual communication design class(es) you teach?*
 - Traditional? Digital?
2. *Why do you request students maintain a sketchbook, notebook, or design journal?*
3. *What do you request be included within the sketchbook, notebook, or design journal?*
 - Only course project work? no inclusion of course project work?
 - Do you assign directed tasks that students can personalize?
 - Do you assign a defined set of exercises related to a current class project?
4. *Do you request that students provide written comments or a critical analysis of some of the visual communication design that they are including in the sketchbook, notebook, or design journal?*
5. *Do you feel your students perceive a value in maintaining the sketchbook? Or do you feel it is only completed for the grade?*
6. *How much course weight do you place on the sketchbook, notebook, or design journal?*
7. *Have you reconsidered the requirement for a sketchbook, notebook, or design journal?*
 - Have you reconsidered the function or how it fits within the course structure?
 - Have you tried alternatives to the sketchbook?

APPENDIX D

INTERVIEW QUESTIONS FOR VISUAL COMMUNICATION DESIGN EDUCATORS

1. Do you ask that students maintain a sketchbook, notebook, or design journal during the period of the visual communication design class(es) you teach?
2. Why do you request students maintain a sketchbook, notebook, or design journal?
3. What do you request be included within the sketchbook, notebook, or design journal?
 - Only course project work? no inclusion of course project work?
 - Do you assign directed tasks that students can personalize?
 - Do you assign a defined set of exercises related to a current class project?
4. Do you request that students provide written comments or a critical analysis of some the visual communication design that they are including in the sketchbook, notebook, or design journal?
5. Do you define the form that it should take or is that left to the individual student?
 - Can it be digital?
 - Are they generally traditional or digital?
6. When assigning the sketchbook do you bring a sample(s) and introduce the possible uses and ways that a personal sketchbook, notebook, or design journal can be utilized?
7. Do you feel your students perceive a value in maintaining the sketchbook? Or do you feel it is only completed for the grade?
8. How much course weight do you place on the sketchbook, notebook, or design journal?
9. What criteria do you use in judging and/or placing a grade on the sketchbook, notebook, or design journal?
10. Have you reconsidered the requirement for a sketchbook, notebook, or design journal?
 - Have you reconsidered the function or how it fits within the course structure?
 - Have you tried alternatives to the sketchbook?

APPENDIX E

STUDENT INFORMED CONSENT

Introduction

You are invited to participate in a research project conducted by Kevin Zak, MDes Candidate, Visual Communication Design, Department of Art and Design, University of Alberta.

This research will look at a common method visual communication design is taught beyond defined projects within courses. Specifically the use of a traditional or digital 'sketchbook' or 'design journal' during the foundation years (first and second years) of a design education.

Your role in this focus group session will be share your opinions and experiences in using a 'sketchbook' or 'design journal' over the course of your approximate four year design education. This may involve your experiences while at the University of Alberta as well as other post-secondary institutions.

The session will be approximately 30 minutes long and will be audio recorded and transcribed. After removing any identifying information, these transcripts will be assigned an arbitrary code number to ensure your anonymity. If the information collected is quoted or utilized in an MDes thesis report your anonymity will be maintained.

Given the nature of the face-to-face discussion of a focus group session, complete anonymity is not possible. All focus group participants are ask not to share the content of others' comments outside of the focus group meeting.

Your confidentiality and rights

The research with this project complies with the University of Alberta Standards for the Protection of Human Research Participants. Data recorded in the course of this research will be available only to myself and my supervisor. This study has been approved by the University of Alberta Faculty of Arts, Science and Law Research Ethics Board.

I, (please print your name) _____ acknowledge, understand, and agree to all of the following:

- I have been invited to participate in this research study.
- My participation in this study is voluntary.
- I have the right to withdraw from this study at any time with out penalty.
If I choose not to participate the data collected will not be utilized.
- I have the right to my privacy, anonymity, and confidentiality. My name and personal information will not appear on any materials.
- All of the personal information collected here will remain confidential.
- I may be quoted directly in an MDes thesis, and possibly in related papers and presentations, but my anonymity will be maintained.
- Any data collected in this study will be stored in a safe and secure place.

signature of participant _____ date _____

If you have any questions with regards to this research project, please contact:

Principal Investigator

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Supervisor

*Aidan Rowe
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3-77 Fine Arts Building, University of Alberta
telephone: 780 492 8591
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APPENDIX F

DESIGN EDUCATOR INTERVIEW CONSENT FORM

Introduction

You are invited to participate in a research project conducted by Kevin Zak, MDes Candidate, Visual Communication Design, Department of Art and Design, University of Alberta.

This research will look at a common method visual communication design is taught beyond defined projects within courses. Specifically the use of a traditional or digital 'sketchbook' or 'design journal' during the foundation years (first and second years) of a design education.

As part of this research I would like to ask you to share your opinions about, and some of your observations on student experiences with a 'sketchbook' or 'design journal' during your time teaching design. This may involve your experiences while instructing at the University of Alberta as well as other post-secondary institutions.

I am anticipating the interview to be approximately 30 to 45 minutes long. I will audio record and transcribe the interview. After removing any identifying information, these transcripts will be assigned an arbitrary code number to ensure your anonymity. If the information collected is quoted or utilized in an MDes thesis report your anonymity will be maintained.

Your confidentiality and rights

The research with this project complies with the University of Alberta Standards for the Protection of Human Research Participants. Data recorded in the course of this research will be available only to myself and my supervisor. This study has been approved by the University of Alberta Faculty of Arts, Science and Law Research Ethics Board.

I, (please print your name) _____ acknowledge, understand, and agree to all of the following:

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- My participation in this study is voluntary.
- I have the right to withdraw from this study at any time with out penalty. If I choose not to participate the data collected will not be utilized.
- I have the right to my privacy, anonymity, and confidentiality. My name and personal information will not appear on any materials.
- All of the personal information collected here will remain confidential.
- I may be quoted directly in an MDes thesis, and possibly in related papers and presentations, but my anonymity will be maintained.
- Any data collected in this study will be stored in a safe and secure place.

signature of participant _____ date _____

If you have any questions with regards to this research project, please contact:

Principal Investigator

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Supervisor

Aidan Rowe
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telephone: 780 492 8591
email: aidan.rowe@ualberta.ca

HELLO SENIOR DESIGN STUDENTS

RE: KEVIN ZAK'S RESEARCH PROJECT

I'M HOPING YOU
WILL TAKE A SHORT
AMOUNT OF YOUR
VALUABLE TIME
(APPROXIMATELY 40 MINUTES)
TO SHARE SOME OF
YOUR OPINIONS ON
MARCH 00 @ 11AM
IN THE FAB GALLERY

MANY THANKS.
(AND HOPE TO SEE YOU THERE)

APPENDIX H

EMAIL AS INVITATION FOR EMAIL SURVEY

Hello,

I am a graduate student in Visual Communication Design at the University of Alberta. I am researching the use of, and student engagement in, a traditional or digital 'sketchbook,' 'design journal,' or 'notebook' during the foundation years (first and second years) of a visual communication design education.

My research involves both students and design educators. Attached to this email, is a survey regarding the use of sketchbooks that I would like to invite you to complete. I will share the results of the survey with all of the respondents when I have completed compiling the results in April.

The following is a summary and breakdown of the research components as well as an informed consent letter. I will understand your response to this survey as an acceptance of the letter of consent. Data collected in this study will be handled in compliance with the University of Alberta Standards for the Protection of Human Research Participants.

Thank you for your time and consideration.

Kevin Zak
MDes Candidate

If you have any questions regarding this research project, please contact:

Principal Investigator

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Summary

This research will look at a way visual communication design is taught beyond defined projects. Specifically the use of, and student engagement in, a traditional or digital 'sketchbook' or 'design journal' during the foundation years (first and second years) of a visual communication design education.

The use of a sketchbook or design journal can provide:

- **a record of the design process**; the exploration, development, and reflection of various conceptual approaches and ideas during the creative process; a process of turning experience into learning Boud, Keogh, and Walker (1985) described reflection as "those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations."¹

- **a visual and/or written discourse/dialogue with oneself**; a record of an individuals thinking (individual thinking) through of a problem and development of ideas. Pam Locker (2009) makes reference to the importance of drawing skills to designers: “Despite huge advances in technology, drawing remains the quickest and most effective means of communicating ideas from our imagination.”² The inclusion of a notation along with inspirational or influential pieces of design placed within the journal can help clarify the designers own thoughts and the subsequent communication to others.
- **a repository of visual research**; a collection of visuals or concepts that are inspirational or influential to the individual, either in general terms or related to specific projects. As this collection matures and develops it can also act as a reference or resource for future projects or as a visual reminder of design encountered in the past;
- **a documentation of design analysis**; a written documentation of critical analysis of both their own and the work of others they are inspired or influenced by. These ‘notations’ also help with the articulation and communication of this critical analysis to others;
- **a bridge between school projects and the ‘real world’ of design**; to emphasize in the design process a connection between what students are learning in the classroom with the varied cultural, political, and technological experiences that they are experiencing outside of it Katie Salen (1998) proposes to conceive of research as “more than a method of collection – into the realm of connection and creative endeavor.”³ Salen describes “a ‘wander-ground’ between here and there...” similar to defining travel as exploration and a transforming encounter;
- **a design task of personal expression itself**; the physical form or ‘book’ can be very individual, designed to express the personality of the user. Traditionally the sketchbook or design journal has been a bound book of any size deemed most convenient by the creator. It can be of a more generous format or a smaller and easier format to handle and carry around; being less obtrusive when sketching or making note of something in a public space. By virtue of being bound it provided a ready made ordering of thought and process. A digital repository on a laptop can act in very much the same way

Research

This study will involve both senior (fourth year) and entry level (first and second year) visual communication design students, as well as visual communication design educators. The study will be divided into four parts:

1. A focus group with 12 to 15 senior design students (fourth year), who are concluding their undergraduate Visual Communication Design studies at the U of A.
2. A focus group session with 12 to 15 University of Alberta design major students currently enrolled in a Design Fundamentals course (this group represents the first year of study).
3. A survey/questionnaire of approximately 7 main questions to approximately 50 Canadian and American visual communication design educators (attached).
4. An approximately 45 minute face-to-face or telephone interview with approximately six design educators.

APPENDIX I

EMAIL AS INVITATION FOR INTERVIEW

Hello,

I am a graduate student in Visual Communication Design at the University of Alberta. I am researching the use of, and student engagement in, a traditional or digital 'sketchbook,' 'design journal,' or 'notebook' during the foundation years (first and second years) of a visual communication design education.

My research involves both students and design educators. I have completed two focus group sessions with students at the University of Alberta as well as an email survey to Canadian and American design educators regarding their experiences with the use of sketchbooks. I would like to conclude this research by interviewing a limited number of design educators. Would you be interested in sharing your insights in an approximately 45 minute conversation? I plan to share the results of the survey with the individuals who responded when I have completed compiling the results in April. I would be very happy to include you on that mailing if you are interested.

The following is a summary and breakdown of my research components. The data I collect will of course be confidential and handled in compliance with the University of Alberta Standards for the Protection of Human Research Participants.

Please let me know at your earliest convenience if you are willing and we can arrange an agreeable time and place. Thank you for your time and consideration.

Kevin Zak
MDes Candidate

If you have any questions regarding this research project, please contact:

Principal Investigator

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Summary

This research will look at a way visual communication design is taught beyond defined projects. Specifically the use of, and student engagement in, a traditional or digital 'sketchbook' or 'design journal' during the foundation years (first and second years) of a visual communication design education.

The use of a sketchbook or design journal can provide:

- **a record of the design process;** the exploration, development, and reflection of various conceptual approaches and ideas during the creative process; a process of turning

experience into learning Boud, Keogh, and Walker (1985) described reflection as “those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations.”¹

- **a visual and/or written discourse/dialogue with oneself**; a record of an individuals thinking (individual thinking) through of a problem and development of ideas. Pam Locker (2009) makes reference to the importance of drawing skills to designers: “Despite huge advances in technology, drawing remains the quickest and most effective means of communicating ideas from our imagination.”² The inclusion of a notation along with inspirational or influential pieces of design placed within the journal can help clarify the designers own thoughts and the subsequent communication to others.
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- **a documentation of design analysis**; a written documentation of critical analysis of both their own and the work of others they are inspired or influenced by. These ‘notations’ also help with the articulation and communication of this critical analysis to others;
- **a bridge between school projects and the ‘real world’ of design**; to emphasize in the design process a connection between what students are learning in the classroom with the varied cultural, political, and technological experiences that they are experiencing outside of it Katie Salen (1998) proposes to conceive of research as “more than a method of collection – into the realm of connection and creative endeavor.”³ Salen describes “a ‘wander-ground’ between here and there...” similar to defining travel as exploration and a transforming encounter;
- **a design task of personal expression itself**; the physical form or ‘book’ can be very individual, designed to express the personality of the user. Traditionally the sketchbook or design journal has been a bound book of any size deemed most convenient by the creator. It can be of a more generous format or a smaller and easier format to handle and carry around; being less obtrusive when sketching or making note of something in a public space. By virtue of being bound it provided a ready made ordering of thought and process. A digital repository on a laptop can act in very much the same way.

Research

This study will involve both senior (fourth year) and entry level (first and second year) visual communication design students, as well as visual communication design educators. The study will be divided into four parts:

1. A focus group with 12 to 15 senior design students (fourth year), who are concluding their undergraduate Visual Communication Design studies at the U of A.
2. A focus group session with 12 to 15 University of Alberta design major students currently enrolled in a Design Fundamentals course (this group represents the first year of study).
3. A survey/questionnaire of approximately 7 main questions to approximately 50 Canadian and American visual communication design educators (attached).
4. An approximately 45 minute face-to-face or telephone interview with approximately six design educators.

Appendix 2

Indicator Poll - Invitation Email with Questions

Hello,

I am currently a MDES student studying at the University of Alberta. I am interested in the ways in which two dimensional design is taught beyond defined projects within courses. Specifically the usage of, and student engagement in, the traditional design journal or sketchbook (a personal visual resource for students to collect and comment on design they are inspired by and/or exposed to).

As a way of beginning to delve into this topic I would be very grateful if you could respond to two very short questions. Yes/no answers are great, but please elaborate if you wish.

Kevin Zak

#1. Do you utilize a design journal or sketchbook as part of your teaching?

#2. Do you feel your students make effective use of this as part of their design education?

Principal Investigator

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Supervisor

Name: Aidan Rowe

Department/Faculty: Art and Design, Faculty of Arts

Campus address: 3-77 Fine Arts Building

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Appendix 3

Indicator Poll - Compiled Results

questionnaire sent to 41 individuals

15 Canadian design schools

1 English design school

15 responses received in total

#1. Do you utilize a design journal or sketchbook as part of your teaching?

10 - yes

3 - no

1 - inconclusive

#2. Do you feel your students make effective use of this as part of their design education?

5 - yes

0 - no

5 - yes/no

3 - do not use sketchbook

1 - inconclusive

Notes:

- one response disregarded, instructor of drawing/illustration class
- one inconclusive for question one and two
- one has given sketchbooks with assigned tasks included within the sketchbook
- three mentioned that students did work in a sketchbook after the fact to satisfy the requirements of course/assignment

Appendix 4

Design Educator Questionnaire - Invitation Email

Hello,

I am a graduate student in Visual Communication Design at the University of Alberta. I am researching the use of, and student engagement in, a traditional or digital sketchbook, design journal, or notebook during the foundation years (first and second years) of a visual communication design education.

My research involves both students and design educators. Below in the body, as well as attached to this email, is a questionnaire regarding the use of sketchbooks that I would like to invite you to complete. I will share the results of the survey with all of the respondents when I have completed compiling the results in May/June.

Attached in pdf form is the questionnaire, a summary of the research components, and an informed consent letter. I will understand your response to this survey as an acceptance of the letter of consent. Data collected in this study will be handled in compliance with the University of Alberta Standards for the Protection of Human Research Participants.

Thank you for your time and consideration.

Kevin Zak
MDes Candidate

If you have any questions regarding this research project, please contact:

Principal Investigator	Supervisor
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Art and Design	Art and Design
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telephone: 780 492 7877 email: kzak@shaw.ca	telephone: 780 492 8591 email: aidan.rowe@ualberta.ca

Appendix 5

Design Educator Questionnaire – Consent Form

LETTER OF CONSENT

You are invited to participate in a research project conducted by Kevin Zak, MDes Candidate, Visual Communication Design, Department of Art and Design, University of Alberta.

This research will look at a common method visual communication design is taught beyond defined projects within courses. Specifically the use of a traditional or digital 'sketchbook' or 'design journal' during the foundation years (first and second years) of a design education.

As part of this research I would like to ask you to share your opinions about, and some of your observations on student experiences with a 'sketchbook' or 'design journal' during your time teaching design.

I anticipate the survey to take approximately 10 to 15 minutes. No identifying information will be attached to the information collected. If the results are quoted or utilized in an MDes thesis report your anonymity will be maintained.

Your confidentiality and rights

The research with this project complies with the University of Alberta Standards for the Protection of Human Research Participants. Data recorded in the course of this research will be available only to myself and my supervisor. This study has been approved by the University of Alberta Faculty of Arts, Science and Law Research Ethics Board

With your response by email to the questionnaire you acknowledge, understand, and agree to the following:

- I have been invited to participate in this research study.
- My participation in this study is voluntary.
- I have the right to withdraw from this study at any time with out penalty.
If I choose not to participate the data collected will not be utilized.
- I have the right to my privacy, anonymity, and confidentiality. My name and personal information will not appear on any materials.
- All of the personal information collected here will remain confidential.
- I may be quoted directly in an MDes thesis, and possibly in related papers and presentations, but my anonymity will be maintained.
- Any data collected in this study will be stored in a safe and secure place.

If you have any questions with regards to this research project, please contact:

Principal Investigator

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Appendix 6

Design Educator Questionnaire - Questionnaire

DESIGN EDUCATORS, QUESTIONNAIRE

1. Do you ask that students maintain a sketchbook, notebook, or design journal during the period of the visual communication design class(es) you teach?
 - is it traditional? digital?
2. Why do you request students maintain a sketchbook, notebook, or design journal?
3. What do you request be included within the sketchbook, notebook, or design journal?
 - only course project work? no inclusion of course project work?
 - do you assign directed tasks that students can personalize?
 - do you assign a defined set of exercises related to a current class project?
4. Do you request that students provide written comments or a critical analysis of some of the visual communication design that they are including in the sketchbook, notebook, or design journal?
5. Do you feel your students perceive a value in maintaining the sketchbook? Or do you feel it is only completed for the grade?
6. How much course weight do you place on the sketchbook, notebook, or design journal?
7. Have you reconsidered the requirement for a sketchbook, notebook, or design journal?
 - have you reconsidered the function or how it fits within the course structure?
 - have you tried alternatives to the sketchbook?

Appendix 7

Design Educator Questionnaire - Compiled Results

1. Do you ask that students maintain a sketchbook, notebook, or design journal during the period of the visual communication design class(es) you teach? - is it traditional? digital?

traditional [9 responses]

- encourage flat bond pads of paper over hard cover, bound books
- assigned to start the storyboard or thumbnail phase of each project in their traditional sketchbook

either, student chooses [1 response]

- It is their choice whether it is traditional or digital.

both traditional and digital [5 responses]

- can be both though traditional is preferred. Students are encouraged to work in a sketchbook but if they have digital proofs or sketches produced on other material they can paste/tape/stitch it in!
- we ask students to submit process work for all their studio projects. This process work included documentation from concept to final design and sketches are a large part of the front end of the process. Typically sketches are done by hand as thumbnails or larger drawings but the process work also included digital iterations.
- students are asked to keep a record of their design process. Depending on the type of projects, keeping track of their sources and recording their process is often completed by mixing sketches, hand written sentences and digital attempts of 2D or 3D models. In the end and for practical reasons all process books needs to fit within a DVD. The aim is to facilitate the review of many process books while making sure that a durable back up of the students work in progress is quickly retrievable at anytime.
- Visual Language courses traditional sketch book / Interactive system course digital documentation
- Both depending on the course.
- In most classes I ask for process work, but is more project based than course based. This may be in the form of loose pages or as part of a sketchbook. For my most recent Research Methodologies class, I asked each student to maintain a web log over the period of the course.

not requested [4 responses]

- I'm wary of class requirements that are not expressly focused on making better work. Rather than sketching, I encourage students make several iterations of a piece. Students are naturally scattered, and adding requirements does not add up to improvement. Rather it makes them busy, which is not the same thing.
- I request that students maintain a record of their process for all projects. Some projects involve maintaining a journal specifically about the project but I don't require students to all keep general sketchbooks or notebooks.

- in this course, it is optional, but they have to submit a process book of research work, brain storming tree, sketches and process work which they put together in Indesign. Some of the hand drawn sketches are from their sketch books or visual diaries.

2. Why do you request students maintain a sketchbook, notebook, or design journal?

- need to learn to discover their own 'found imagery'
- important that they have a "lab" in which to experiment freely, in which they can make mistakes without fear, where they can develop ideas and play. It is a place for pure creation.
- a process recorder. It is a diary of open creativity and boundless freedom. It is a place to note initial thoughts and perceptions and sketch preliminary visual possibilities without judgement. It is a place to return to if a project goes off course and it can be a wayfinder to get back on track.
- for first year to communicate the value of sketching and drawing in their design practice.... because sketching by hand can be a more immediate way of recording ideas and testing concepts. Sometimes when students focus too much on digital means of expression, they get caught up in the production of the work rather than in the concept itself. Drawing facilitates design thinking.
- practice drawing, medium, and to conceptualize
- memory of work in progress and see working method in the long run...can also help them materialize what four years in a design program means and how their working method responded and evolved with different situations. - Another goal is also to help students articulate and reflect upon the relevance, purpose and challenges offered by a class or a project. At the end of each project students are asked to summarize in writing their own view point about the project, its demand and their response to it. This text is often an occasion for the instructor and the student to share and elaborate on ideas that cannot fit the dynamic of the classroom (lack of contact hours or introvert personalities of some students). Process books are tangible demonstrations of the care, efforts and attempts students deployed.
- develops visual awareness, practices drawing skills, keeps a record, a place to put down ideas
- the notebook, or documentation of their process thinking a) helps them to reflect on their process thinking; b) allows me as a teacher to see their thinking; c) a sketch book also helps students to release their ideas from their thoughts freeing them to explore different ideas; d) it allows me, as an instructor to identify that they are not thinking about different ideas as much as refining one single idea or doing variations of the same theme; e) having the ideas crudely drawn on a piece of paper allow them to see patterns in their approaches and start to mix their own concepts to come up with new concepts
- to record their research, idea-mapping, design process incl. typographic and layout design. To encourage exploration, ideation, development and refinement before finishing on the computer.

- gives an insight into their process, lets you see them at their most raw, and gives the best idea of how they work. An empty sketchbook feels like an empty head, devoid of any ideas, content just to rip things off. A full sketchbook, bursting at the seams, tattered and dishevelled with use feels like a productive idea factory.
- design requires practice as well as an understanding – and development – of process.
- underline the importance of, and stimulate, reflection and consideration of what constitutes their design.
- much easier for ideas to remain fluid and open in handmade form. In my experience ideas appear on paper quicker than sitting in front of a computer.
- they need to draw/sketch out their ideas/explore process
- ideas flow more freely without the constraints of a computer. Sketching is an enormously important design tool.
- to maintain a record of their process to ensure that plagiarism isn't occurring and to gauge the amount of development and effort put into a project
- to articulate their design ideas and to learn to use a design journal for their professional careers

3. *What do you request be included within the sketchbook, notebook, or design journal?* - *only course project work?* - *no inclusion of course project work?* - *do you assign directed tasks that students can personalize?* - *do you assign exercises related to a current class project?*

only course project work [3 responses]

- project related concept, development and refinement
- week by week tracking of time spend on a project - written summary to explain what cannot be easily spelled out in class - record of conceptual and formal development
- assigned as a bound record of the early phases of class projects
- process books also feature all handouts and notes taken during lectures, charettes or seminars when applicable.

course project work with assigned exercises [7 responses]

- need to post other versions of their submitted work, then weekly tasks also (eg, photograph patterns in nature)
- process work for projects and some in-class exercises for fun or exploration not directly related to projects
- all course project work, assigned questions on readings and design process as well as project work
- What is included in the process document is their initial research, what influenced their decisions— both visual, text or audio. Initial sketches, any significant changes in direction, a type study, a colour study, Some times demographic, psychographic boards; mood boards, story board - *do you assign directed tasks that students can personalize?* Sometimes we ask them to do a demographic or psychographic analysis. We often get them to do mood boards and various studies. Line, value, colour, type study. Sometimes a S.W.O.T. analysis or creative brief is required. - *do you assign exercises related to a current class project?* In

interactive system classes we assign a project statement, a user study, personas, scenarios, needs and wants analysis, issues analysis, means/ends analysis, a system map, and an information flow chart, wireframes structure, and a usability test.

- In first year design foundation courses we also incorporate drawing exercises in class to support project work.

no course work [1 response]

- first 20 minutes of class to work in their "Visual diary". At first i set loose projects to get them going.

any thing /everything [2 responses]

- anything that the student considers relevant to the project
- even if it doesn't directly relate, so long as it loosely catalogues their process throughout the year; encourage them to incorporate work from other classes if it applies

4. *Do you request that students provide written comments or a critical analysis of some of the visual communication design that they are including in the sketchbook, notebook, or design journal?*

written comments [8 responses]

- encourage notations, and allow ruminations, quotations, poems etc.
- encourage writing down concepts and key words that come while trying to define a problem
- written comments are encouraged. I like to see their reflective process
- I indicate that I strongly value rationales and commentary
- but separately. Important that ideation phase separate from evaluation phase
- process work document usually includes a written project rationale or reflection where the student outlines their design thinking, decision making, and what they have learned from the project
- Students provide a written rationale along with sketches in 2nd year visual communications classes, a creative rationale in 3rd year and a creative brief + a creative rationale in 4th year, all along with sketches and a digital process chronology of the project's development and refinement.

no written comments [4 responses]

- this would make it another project. review sketchbook with student to discuss their thought process, as well as where they might explore further
- Students have to submit a summary of their experience in using the design journal.
[1 response]
- no written comments in the first year – second year students need to comment on each other's work
[1 response]

5. Do you feel your students perceive a value in maintaining the sketchbook? Or do you feel it is only completed for the grade?

perceive value [4 responses]

- Absolutely!! They are proud of them
- student feedback indicates value – particularly the second year students
- I think the majority of the students understand the value of sketching and drawing as it is a natural part of their design process. Some may be reluctant to do it because they are not confident about drawing. When it is explained that sketching is a tool for design thinking rather than an end in itself, then they are more apt to engage in it.
- definitely see the value in starting out rough and less defined with hand drawings, refining ideas, and then moving on to digital formats. But, there is always the obligation to do it for the grade.

mixed [11 responses]

- varies according to student. Without exception, higher-achieving students treasure their sketchbooks as personal journeys.
- both. Students are hugely resistant, the best ones appreciate the value in it (often much later)
- not all perceive value; some later, some completely convinced.
- At first it may just be for the grade but they usually come to value the sketches.
- first year students not likely to do it completely on their own initiative, but over time I believe they saw the value
- 60 / 40
- Some do, some don't; majority welcome the opportunity to express their thoughts and experience in writing. The written summary is very often the place where they feel free to express doubts or certainties without the fear of judgemental reactions from their peers or instructor. I also had students, who, few years after graduating were happy and grateful to be able to revisit not only the outcome of their work but also the working method they used to reach these outcomes
- students often don't see the relevancy of the process development, but you can see the ones who have adopted the process and don't resist often will do better work. Better not necessarily graphically, but better concepts, this is partly due to the fact they can ask more poignant questions that can inform their work.
- About 50% will do it because they have to, they find the process beneficial and enjoy it in the end; 25% would do it anyway, 25% have to be dragged kicking and screaming into producing a sketchbook, you can tell it's half-hearted, usually reverse-engineered after doing their digital work, so it's for marks only.
- artificial aspect to much process work – some verbally indicated the recording of process was useful
- I'm not convinced that they see a value, depends on the project, for some projects yes, others, I believe they generally view it as an extra task they would rather not complete.

no perceived value [3 responses]

- Most students just want to jump in the project and see the sketchbook and any ideation process as holding them back (often to their detriment). I have to work to show them the benefits (including a lecture that is based entirely on process where I use my own sketchbooks to illustrate my frustrations, searching, struggles and the “successful” final designs).
- majority just for the grade
- when required to keep a sketchbook, they are doing it for a grade. It leads them to measuring academic success by counting pages, hours, etc. rather than taking a hard look at whether they are a better designer when they come out of a class than when they went in.

6. *How much course weight do you place on the sketchbook, notebook, or design journal?*

- 10% [3 responses]
- 15% [2 responses]
- 20% [2 responses]
- between 20 - 30% [1 response]
- 30% [2 responses]
- 30-40% of the final course grade [1 response]
- roughly 50% [1 response]
- specifically, none; research generally constitutes between 25 and 50 percent of a project grade [1 response]
- 15-50% of grade is process related [1 response]
- pass/fail [1 response]
- 10% for year 1, 30% for year 2 [1 response]

7. *Have you reconsidered the requirement for a sketchbook, notebook, or design journal?*

- have you reconsidered the function or how the sketchbook fits within the course structure?
- have you tried alternatives to a sketchbook?

no [5 responses]

- I think it will always be necessary to hand-render initial ideas and brainstorming. I've never tried alternatives to the sketchbook though.

- Admittedly, in undergrad I never kept a sketchbook, and only realized it's value after owning a design studio and using it as a barometer of a student's work process. Now I feel its value is paramount, so yes it is something I came to reconsider later. It's now a necessary component in my course structure. I've not tried alternatives, but I could see something like a blog being a reasonable alternative especially for digital natives, and it's something I may consider. I could see graduates taking say an iPad to job interviews and showing their process this way. Though I doubt it will ever match the tactility and object fetishism the sketchbook has acquired.
- I think the time is better spent making iterations of a project rather than planning. I'd rather a student make two versions of a book than one version of that book and a sketchbook. And some students keep a sketchbook – digital or otherwise – on their own, because they have found it to be a way to help them make better work.
- Only reducing the quantity per week, contingent on workload in other areas.

yes [11 responses]

- We are always thinking of ways of improving the sketching and documentation process for student projects. They are usually paper documents so to reduce the amount of printing some professors will accept PDFs, web sites or wikis (good for group work) instead. This approach works particularly well for interaction design projects. Personally, I have started to give students an option of submitting their process work digitally or as a printed document. What is important is that the documentation is detailed, relevant and thorough and the student has demonstrated an engagement within the design process. Digital documentation also includes sketches that are scanned.
- There has been discussion with other instructors, however the unanimous feeling was that the sketchbook remains a vital part of the student's growth.
- I think the process has to be better revealed to the students. The problem is that when they are in the process they are not aware of its benefit. They feel that because it is not their process it is not legitimate. That the process should be personal to them and whatever their process is in achieving the design is fine. Firstly the problem with this is that some are already closed to different methodology and we instructors should open many different methods of thinking to our students. Also no matter what process they adopt students must realize they are dealing with a process. The notion because "I designed it and any observations by others is purely subjective," is very naive. Of course it is subjective, this is why they need to approach their work from an objective standpoint in order to prove its value to others. *[have you tried alternatives to a sketchbook?]* Digital blogs are also very successful. Somehow they feel it is less work. However there are drawbacks that are starting to emerge. Some students use blogs to build consensus from their colleagues and they resist even more what the professor is commenting about their work because it contradicts what their friends commented.
- The recording of process is very important. I am equivocal about what the best form is. Different forms suit different students. *[have you tried alternatives to a sketchbook?]* Yes, blog. In most classes I ask for process work, but is more project

based than course based. This may be in the form of loose pages or as part of a sketchbook. For my most recent Research Methodologies class, I asked each student to maintain a web log over the period of the course.

- Yes, yes, and yes. I now allow it to have some digital content, depending on the course, but some of it MUST be scanned hand drawings.
- I have reconsidered it for certain classes (they were very proactive and didn't require encourage-ment to maintain a sketchbook). However, it will be implemented again because current students need to take the time to think out a project.
- I guess I am always re-considering the things I do each term, but this particular format seems to be working.
- I have not tried an alternative to process books. However, using basecamp as a tool to manage projects or classes proves to be a valuable complement for the instructor to help the evaluation of students' work while recording part of the work of an entire class.
- We tried sketchbooks, with student's drawings, at first. They didn't work, because most students don't have good drawing skills and therefore didn't develop a commitment... We had to choose: drawing practise, or developing visual acuity/ a personal vision
- Always reconsidering the format, but not the inclusion of it. *[have you tried alternatives to a sketchbook?]* We call ours a visual diary. It includes some collages, photography, scrap book as well as drawing.
- Over the years we have placed more and more emphasis on a well-recorded process, written, sketched and digital, within the requirements and evaluation. *[have you reconsidered the function or how the sketchbook fits within the course structure?]* - emphasize drawing and sketches as an integral part of the process. We consider the process to be the philosophy of design.

Appendix 8

Design Educator Interviews - Consent Form

DESIGN EDUCATOR INTERVIEW CONSENT FORM

Introduction

You are invited to participate in a research project conducted by Kevin Zak, MDes Candidate, Visual Communication Design, Department of Art and Design, University of Alberta.

This research will look at a common method visual communication design is taught beyond defined projects within courses. Specifically the use of a traditional or digital 'sketchbook' or 'design journal' during the foundation years (first and second years) of a design education.

As part of this research I would like to ask you to share your opinions about, and some of your observations on student experiences with a 'sketchbook' or 'design journal' during your time teaching design. This may involve your experiences while instructing at the University of Alberta as well as other post-secondary institutions.

I am anticipating the interview to be approximately 30 to 45 minutes long. I will audio record and transcribe the interview. After removing any identifying information, these transcripts will be assigned an arbitrary code number to ensure your anonymity. If the information collected is quoted or utilized in an MDes thesis report your anonymity will be maintained.

Your confidentiality and rights

The research with this project complies with the University of Alberta Standards for the Protection of Human Research Participants. Data recorded in the course of this research will be available only to myself and my supervisor. This study has been approved by the University of Alberta Faculty of Arts, Science and Law Research Ethics Board.

I, (please print your name) _____ acknowledge, understand, and agree to all of the following:

- I have been invited to participate in this research study.
- My participation in this study is voluntary.
- I have the right to withdraw from this study at any time with out penalty. If I choose not to participate the data collected will not be utilized.
- I have the right to my privacy, anonymity, and confidentiality. My name and personal information will not appear on any materials
- All of the personal information collected here will remain confidential.
- I may be quoted directly in an MDes thesis, and possibly in related papers and presentations, but my anonymity will be maintained.
- Any data collected in this study will be stored in a safe and secure place.

signature of participant _____ date ____ _

If you have any questions with regards to this research project, please contact:

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Appendix 9

Design Educator Interviews - Interview Questions

INTERVIEW QUESTIONS FOR VISUAL COMMUNICATION DESIGN EDUCATORS

1. *Do you ask that students maintain a sketchbook, notebook, or design journal during the period of the visual communication design class(es) you teach?*
2. *Why do you request students maintain a sketchbook, notebook, or design journal?*
3. *What do you request be included within the sketchbook, notebook, or design journal?*
 - *Only course project work? no inclusion of course project work?*
 - *Do you assign directed tasks that students can personalize?*
 - *Do you assign a defined set of exercises related to a current class project?*
4. *Do you request that students provide written comments or a critical analysis of some the visual communication design that they are including in the sketchbook, notebook, or design journal?*
5. *Do you define the form that it should take or is that left to the individual student?*
 - *Can it be digital?*
 - *Are they generally traditional or digital?*
6. *When assigning the sketchbook do you bring a sample(s) and introduce the possible uses and ways that a personal sketchbook, notebook, or design journal can be utilized?*
7. *Do you feel your students perceive a value in maintaining the sketchbook? Or do you feel it is only completed for the grade?*
8. *How much course weight do you place on the sketchbook, notebook, or design journal?*
9. *What criteria do you use in judging and/or placing a grade on the sketchbook, notebook, or design journal?*
10. *Have you reconsidered the requirement for a sketchbook, notebook, or design journal?*
 - *Have you reconsidered the function or how it fits within the course structure?*
 - *Have you tried alternatives to the sketchbook?*

Appendix 10

Design Educator Interviews - Edited Selections

Participant A

follow process during project and at the end of project students are asked to create a process booklet (visual and written) which shows breakdown of project including all process work with sketches, brainstorming mockups, and design rationale; this could be presented to a client as a way to illustrate the work and stages of a project to show design outcome

not as personal thing as a sketchbook, just for the one specific project, becomes artifact of the focused thinking for that project, not a personal resource

sketchbook difficult to grade, this process book graded with rubric provided ahead of time

what is missing in these process books is the reaction/reflection to contemporary designers work - tried to capture this through a design reflection blog; through term the students need to do 7 posts furthering something covered in class and comment 7 times on other students posts

felt students were not engaged in this enough so tried instead having students do posting regarding 7 different readings provided in class and find work from other designers that they feel relates to the reading

he asks for process book to see why and how students arrived at the visual solution they did and to demonstrate the work they did towards the final solution

show that the eureka moment is not always there to be counted on, this provides a process and for them if they have the designers equivalent of writers block

worth 10-20% of the final grade - the more complicated the project the higher the grade for the process

set parameters and quantities for what the book should contain in regard to sketches etc this set to helps to develop the critical thinking and analytical skills

building skill of showing clients the process to the final solution, it validates the final solution and helps the client see value for money in the design work

blog allows constructive reflection and articulation of work and builds skill of clarifying thoughts in writing; mixed response/engagement to blog

form defined for the process book, assembled in InDesign with cover, table of contents, rationale, with specific binding, equated to a proposal to a client; student gets list of what needs to be included, how they order content it is up to them

Participant A con't

this book gets the designer thinking about process and defines scope for both, template provided so the student can focus on content not the structure

process book not heavy on writing but includes rationale, done at the end of the project to defend the final design

traditional and digital presentation, no template defined - they design/create the process booklet once and can tailor and refine as they continue to create it

does student perceive value? no real fair assessment of what the students feel, some see students see value and others do not, some resistance at first and then later after creating many

he is looking at quality of exploration in sketches, can he understand/see a clear idea?

discuss value of a writing workshop? creating a tie into an english class

the technical assembly and output of the process book is tied to another technical software class

includes also "competitive audit" - including what have they been inspired by and what are others doing related to project

struggles with how to fairly grade the book in concrete way - traditional sketchbook feels like looking into a students brain

finish with discussion of critiques and presentation and discussion of final product; also the students reluctance to say anything negative at critique when they know it's too late to make changes before grading

Participant B

provide a small 5 x 7 inch spiral bound sketchbook to individual students that they can carry with them where ever they go as part of the orientation to the course - first class they take is a basic drawing class; rendering 3 d object to the 2 d surface; this class is a foundation to design or fine arts this is called a 2d design class encapsulates prereq to multiple 2d disciplines - course more about concept not technical software classes - teach some techniques that are digital some traditional - he asks for lists/words and writing - he refers to it as vomiting on the page - getting it out to write down what comes to you mind - a combination of writing and drawing

2. take what they are thinking and quickly put it on paper and document it and then can look through notes to analyze what the student is trying to say

assigned tasks? no specific tasks assigned, the book becomes a record of the process in a project - they will put up sketches / thoughts for class discussion - do not collect sketchbook at the end of a project or term but the students do use them as part of showing thought process as part of admission of upper level classes to show how they arrived at solutions during review

4. including words - self analysis of ideas/ process?

not formal self reflective - as group they will analyse the sketches of fellow students - and will arrive at a direction and provide opinion of the strongest direction to move forward on - they may later return to the initial sketches if that approach does not work out - he calls it a "collective dialogue" good discussion comes from visuals/words/and talking about direction becomes group recommendation of direction to move forward - although as the "authority" in the room he will provide opinion/direction if the solution is not good or has been done before, even as all students are saying that they love the idea

- students get more out of this discussion in smaller groups - he becomes moderator of discussion - if the students come with minimal work he will say that there is not enough to respond to

5. defined form? provided sketchbook at start of course - not digital

6. assigning: bring in and show his own sketchbook - with words - shows things that he is working on "The Journey of the Destination" as example - explains to use color and things found on the street - and to use whatever they have at hand to capture an idea - stresses idea that it becomes their own personal resource

7. students perceive value? students find it challenging to write thoughts - he feels it is difficult for them to slow down and really think through issue / function of problem presented - but in the end he feels they do see the value as good way to work through project to final solution - grade assigned for process worked through per project - blended into overall grade: color/type/realization/process - if pressed to assign grade to process - he feels it is very important especially for students - he will also show his own work in progress to his students to show them that it can sometimes be simpler and can sometimes be a struggle

- at end of conversation talked about the importance of recording the process and thinking especially at the student level, later they will fall into their own working method, maybe thinking more through the problem in their head but in the early stages providing visual record to look over and back through

Participant C

looking at sketchbooks and how they are utilized in teaching as a supplemental activity not part of the main core

ask for sketchbook? yes, I do ask for “journal” in undergraduate type classes - used collect record their every typographic encounter and write notes about it - essentially interesting typographic ephemera they come across throughout the term and to comment on it - good and negative why they felt this was either good or bad typography - to be aware of typographic possibilities around them

the idea of this is to open the students eyes to what is around them - type being so ubiquitous - this makes them look/collect/comment about the type they encounter

they can include other work as well but generally generally students will place process/sketching/ notes in another book

the journal is accessed at mid-term and at the end of the course and is worth 10% of overall grade

specific to project? no general whatever I find or what ever they see with comments so he knows what they have collected what they have

why ask for journal? not just about project - the students to be typographically aware, not just looking at type in reference to assignments in the course typeform and how they are utilized - really a type based journal

specific tasks in journal? he wants it explorative - not just in print - pull from all kinds of places - take photos exercises? no

for all projects he asks for research/sketches/process work in a 3-ring binder that is handed in with the final work - “process book” he requests this for all his classes

written comments? yes, not extensive but a note of “why”

define the form of the journal? encourages a 9 x 12 bound sketchbook - can be spiral bound - 4x5 too small and limiting

accepted a digital journal? no, the extra step of scanning makes it more a chore (more work) in his mind so which is a detriment to what the journal is about - do students ask re digital? no

show examples when assigning? yes, provide real world examples of sources for them to be looking

he wants it to be theirs he wants them find some ownership to projects, and not just meet all of the parameters that were defined, he wants them to interpret to find some way into it on their own; some students create their own cover to create something more personal

Participant C con't

do the students percieve value? 60% do; 40% do not, looks like they might have done it the night before; completed because it was assigned - even after reminders - he tells them to collect the items in a folder - very very few do not bother doing it at all - he feels in the end if they are doing it they feel it is of value to them

journal worth 10% of overall grade - process work worth around 20% plus with each project, worth more in higher courses and in more demanding projects when the project was strongly about process/development

criteria for marking/judging journal? variety, thoughtfulness in the comments, quantity (should be half way at mid-term and full by the end of term), depth of selection of choice

reconsider the way the journal and developmental work fits into course? no, not really but would be open to alternatives influence of students wanting more digital? something to the tactileness of people as beings,

"Typeface" movie about the Hamilton Press in Wisconsin

he likes the idea of students learning about real space type by being able to touch it and move around real type forms interested in the possibilities of letterpress

Participant D

sketchbook, a low risk place for risk

books: *Everyday Matters*, Danny Gregory, collection of drawings and writings about conceptualizing and experiencing a place, NY diary; Princeton Architectural Press

A year in Japan Kate T Williamson, Princeton Architectural Press

Drawing from life, the Journal as Life (collection of sketches and philosophy on sketching)

Sketchbooks, the Hidden Art of Designers, Artists and Creatives; Laurence K Publishing

have always had a sketchbook component to his classes: 10% of grade

he has noticed a change in students over the 15 years he has taught, students that were technically very strong then a change, completely different thing, these students had no computer experience beyond social networking, the sketchbooks from them had nothing in them, no exploring, something else he noticed was they were very goal oriented, they just wanted to get the end product done; the creative path is a wiggly line, they saw him, the educator, as an art director, they thought he was to draw the solution out of them as quickly as possible

adjusting the program reflecting the change they have seen in students, the first year as primarily hand work, the students couldn't understand this... he explained that they were being taught to see,... and they don't really see by just taking pictures, so they do observational drawing - students drew what they knew was there, not from their perspective

do you ask students to maintain a sketchbook? why?

he calls it a sketchbook, but thinking of calling it a journal "an artifact of experience"

can be project related or broader

began to integrate assignments into sketchbook, both as pre-concept

and conceptual development

finds students goal oriented - feels they need to "unlearn" this linear path from a to b

place where they can play and explore and place for writing - before visualizing,

write key words

work in sketchbooks as foundation for design projects will accept either digital or traditional

he does bring and show a sketchbook as an example when he is assigning it
his class only once a week - he uses the sketchbook for consistency - keeping the students thinking between between classes

does not like the term: sketchbook, "pajorative" going to use "journal"

Henrick Drasher - does collections of sketchbooks- drawing and explorations -

(films the soak)- soaks completed sketchbooks in bathtub

Participant D con't

encourages students to explore and ask questions of what they are producing and why...

do students perceive value in using sketchbook? "they have a risk of failure"
he finds in the last number of years increasingly fewer and fewer do find value - but the ones who do engage it really see the benefit - they see the value the efficiency of the process as opposed to people who work only on the computer - the people who only work on the computer work their work looks very much a "same" look - it lacks the lateral jumps unlike the sketchbook work with a pen, becomes your visual language, that only you need to understand - "...the computer at times encourages too much linear thinking as opposed to lateral thinking..." "the sketchbook encourages the messy and unrefined, unlike the computer"

he grades on 4 categories: conceptual merit (the idea is important), aesthetic quality (we respond to aesthetics), fits the purpose (design is about solving problems), quality of execution.

UI interfaces, traditional layers, digital layers, temporal layers (layers in time, ie opening credits of movies)

Graphic Design and the New Basics, Ellen Upton Jennifer, Princeton Architectural Press
design education taking into account new technologies

"Book by It's Cover" - blog <http://www.book-by-its-cover.com/>

still story board for video animations completely digital

sketchbooks are places to ask questions, explore ideas,

"Sketchbook Pro" minimal interface that fades away while your working/exploring for ideas
Wacom - drawing on the screen... easily and quickly shared -simulate traditional tools

computer is intellectual process - drawing a physical process and intellectual

he has reconsidered the sketchbook - because people are not engaging with it - up to him to find ways to help them engage

Evan Hecox - vimeo case design - type in the landscape - his work crosses boundary between art and design < <http://evanhecox.com> >

Participant E

yes, I do ask that students maintain a notebook/sketchbook - first course in graphic design

why? - methodologies of process and making for the student to look at the process - elaboration of possibilities and identification of possible solutions

he wants the sketchbook to contain all project work - but they should consider moving to an electronic blog to capture the visual research the students do for a project - because they know the students are only looking online - utilize 'blogger' - easier to maintain use by asking to see it every week

to help them [the student] understand the process they have done toward the solution of the problem

the requirement they make for the sketchbook is that he can pick it up and nothing falls out

the majority of students do not see the value [of maintaining process] at the time, but they do after

blended learning - face to face and on-line through blog sketchbook/collection bin

students need to create a process book at the end of the course

"makes me uncomfortable that we're losing hand work, my hope that in the future the transition to things like the ipad will somehow bring back the haptic into the electronic... that we will be moving things and touching things with our hands again, not typing and a cursor, getting back to a more direct feel of things, and it would be a good thing to get back there"

Participant F

do you ask your students to maintain a sketchbook?

teach first year (freshman) and yes do require it, later years have habit established so do not make it requirement

they call it: process book, tracking process documentation of the students work; keeping notes and sketches for themselves

why do you require it?

first and second year, the school stresses the importance of process, design not just the beautiful end product, it's really the development of logical steps, by this recording helps them develop a good working process and that this process is really just as important as the end product

articulate ideas in a visual form beyond text, and getting them to stop and reflect on what they are doing, and getting them to slow down a bit

not every step you take is not necessarily forward....

only project related? - never regulated that, the students private space so if it's bringing in things from other places thats okay

ask for reflective writing within sketches?

yes, self reflection is very important to foster their writing and development

also include inspirational material collected in visual research

they will do hands-on projects to show them that design is more than learning software

it takes a semester or two for the student to see the value in the process book

she does not assign a grade to the process book - helpful for the student to see what they are being assessed on, how their grade is derived - she stopped making it quantitative - creates a rubric on what constitutes those performance attributes - but by quantifying those certain elements you force yourself and the student to look at those attributes in isolation as opposed to looking at them holistically

- they might reference those elements when discussing the work, but do not grade specifically she provides them the same tool she uses in evaluating their work for them to self-assess

points in assessing process work: 1. range of ideas (looking at it from multiple perspectives); 2. follow a conventional or predictable approach (are they really pushing themselves); 3. superficial exploration or did they go deep into the problem/idea; 4. and most importantly, patterns: are they consistently improving and growing through self reflection and branching out, so they are learning from previous experiences and trying different things; 5. clarity of the ideas presented

Participant F con't

she has done a class once-a-week class where they blogged but she does not feel it replaces the face-to-face interaction

as technologically savvy as people are, it's still great to get ideas out through the proverbial napkin sketch - some students still prefer to do things that way

the changes she has made to the sketchbook:

she feels now in her teaching that the role of the sketchbook is more successful by being less forced and prescribed...keeping it more open and personal to them, more of a personal and customized process record - showing examples but not making it required (they find the way that works best for them)

one of the ways students see value is during one-on-one conversations with them is that they can go on and on talking about what it looks like...her response is: yes, but what does it look like? with the visual they can have a conversation about it and she can provide better feedback

"sketchbooks are really good at facilitating conversation"

Mark Baskinger

<http://vimeo.com/7339214>

Participant G

teaches two dimensional design

entry level: provide students a sketchbook - 5 x 7 to take with them where ever they go to get them accustomed to rendering forms on a two dimensional surface - later they define their own form - generally not digital

lists of words at the start of a project - vomit on the page....get it all out

why do you ask for a sketchbook?

primarily so they can take what they are thinking and put it down - documenting what they are thinking

define what is to be included?

he does not define what is to be included - they use the sketches as a point of discussion
sketches used through progress of project - the beginning stages of finding a solution

ask for self analysis of their process or solutions?

they do that as a group when looking at the sketches - he will ask the group "in what direction is this individual student going?" as group they have a discussion - a collective dialogue that helps everyone

bring in examples of a sketchbook?

he brings in his own book

The Journey of the Destination

encourages them to pick up things off the road, it can be messy

really just getting information down

do students perceive value?

students find it challenging to write down words, he wants them to slow down and really think about what first comes to mind and where does that lead? that could lead to a terrific solution - in the end they do see value in the exploration - as a way of starting and working through the problem to a stronger solution he does give them a grade for the process - in individual projects - not specific number but is blended into overall grade

not specifically graded - but he feels strongly about the process, the early stage of exploring ideas -

"the sketchbook really just becomes a vehicle to get their thoughts, ideas, and words, lists down, in whatever form...as technology really becomes part of them...they could be carrying around an ipad or something like that.... right now cheapest and easiest is paper"

a well worn book is used...

encouraged inventory of inspirational things? yes, again, for now the sketchbook becomes an easy and effective library where they can return to - easy to jot things down to remember

Participant H

in printmaking at the beginning of a project while talking with students individually, she writes and sketches - she provides this [visual conversation] to the student when they have finished talking - she says she does this for herself, to help her think but it helps both her and student

her own sketchbooks [individual sketchbook per project] contain lots of writing - intellectual theory behind an idea, conceptual writing

she assigned a sketchbook when she taught design - left it open to the student the form: it could be a book, loose sheets, etc ; do it everyday but not to approach as an assignment, do it because you want to do it; sketchbook just a tool, some people like to have idea complete in their head before they start anything, think of sketchbook as sponge, use it to record, capture things that inspire them or that they see, do read and listen to things they would not normally do, or read, etc

- she utilizes a sketchbook in her own work and believes it helps her - she does not make a distinction between designer and fine artist - the difference is the craft of the different disciplines but the basic skill of finding and generating ideas is the same

working on computer is so two dimensional - idea of child "grasping" an idea or meaning understanding something, truly want to 'grasp' it as a physical object - hence the saying - "grasping meaning"

Gen Y grew up with computers - maybe they will invent different creative skills that we cannot think of - "connection between the brain, hand and heart"

people do not think broadly on computer - things look very finished - hesitant to make changes or explore further - working on a two dimensional screen for years - personal feeling/theory but you do not get new ideas - working with software, everything starts to look the same - we need to create a technique to get out of this, to refresh ourselves, after working in a secure method it can become dominating - some people will call this their 'style' - she sees it more as their way of working and not recreating to maintain new and different approaches to grow so that the ideas in your head are always your own - it is essentially a secure way of working - artists/designers need to reinvent themselves

need to provide students an awareness of this - to really look at their work and reflect on it - to be aware of how they work and what they produce -

[Sagmeister takes sabbaticals to work on personal projects to maintain a fresh approach]

Participant I

- hand drawing skills down over the last 15 years
- making changes to program for future but focus will remain to both traditional and digital
- digital helps hand drawing skills - students less intimidated/less hesitant
- drawing/writing in combination - each informs the other
- re “too far too fast” - teaching to provide the caution, ensure exploration, emphasize process
- skills/natural inclination from habit?
- becomes philosophical or trend based discussion on the move to technology
- haptic feedback: described as “(doing) for the sense of touch what computer graphics does for vision”
- future forecasters

Appendix 11

Comparing Ideation Methods – Workshop 1 – Consent Form

INFORMED CONSENT FOR UNIVERSITY OF ALBERTA MUSEUMS WORKSHOP

Introduction

You are invited to participate in a research project conducted by Kevin Zak, MDes Candidate, Visual Communication Design, Department of Art and Design, University of Alberta.

This study looks at the use of a traditional or digital ‘sketchbook’ or ‘design journal’ during the foundation years (first and second years) of a design education.

This workshop will be approximately 60 minutes in length and will be photographed. The discussion concluding the workshop will be audio recorded and transcribed. After removing any identifying information, these transcripts will be assigned an arbitrary code number to ensure your anonymity. If the information collected is quoted or utilized in an MDes thesis report your anonymity will be maintained.

Given the nature of a group discussion, complete anonymity is not possible. All participants are asked not to share the content of others’ comments outside of the discussion.

Your confidentiality and rights

The research with this project complies with the University of Alberta Standards for the Protection of Human Research Participants. Data recorded in the course of this research will be available only to myself and my supervisor. This study has been approved by the University of Alberta Faculty of Arts, Science and Law Research Ethics Board.

I, (please print your name) _____ acknowledge, understand, and agree to all of the following:

- I have been invited to participate in this research study.
- My participation in this study is voluntary.
- I have the right to withdraw from this study at any time with out penalty.
If I choose not to participate the data collected will not be utilized.
- I have the right to my privacy, anonymity, and confidentiality. My name and personal information will not appear on any materials.
- All of the personal information collected here will remain confidential.
- I may be quoted directly in an MDes thesis, and possibly in related papers and presentations, but my anonymity will be maintained.
- Any data collected in this study will be stored in a safe and secure place.

signature of participant _____ date _____

If you have any questions with regards to this research project, please contact:

Principal Investigator

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Appendix 12

Comparing Ideation Methods - Workshop 1 - Outline of Workshop Structure

MACS 'Science Sunday' poster/ecard workshop

Tuesday, 18 January 2010

noon to 1:00 pm

open call to all levels for design of poster and ecard for Science Sunday
awareness via visit to individual classes as well as reminder poster in vcd area

1. general introduction: MACS, Science Sunday, project needs
all participants to sign waiver releasing information/photographs for grad study
2. two equal sized groups: one digital, one analog
two 25 minute concepting sessions followed by a short discussion session

first concept session (25 minutes)

group one - analog: primary type/image secondary

group two - digital: primary type/image secondary

second concept session (25 minutes)

group one - digital: image primary/type secondary

group two - analog: image primary/type secondary

discussion session (10 minutes)

general discussion regarding process toward individual results - discussion
is focused more on the quantity and diversity of the solutions produced and
difference in concepting methods

4. follow up open critique:

Tuesday, 25 January

noon to 12:45 pm

group critique of refined work one week later with interested students
who wish to submit work

Appendix 13

Comparing Ideation Methods - Workshop 1 - Post-Workshop Questionnaire - Initial Session

UNIVERSITY OF ALBERTA MUSEUMS DESIGN WORKSHOP

Just a few questions from today....

What level are you at in your design education? 300 400 500

Did you find you were more productive in either of the sessions or that your solutions were more diverse from each other?

If so: In which session? sketching digital

Was this the first or second session? first second

Do you feel it was because of the method of visualizing your concepts? yes no

Please elaborate if you wish:

In tackling a any design project where do you normally begin capturing/visualizing your conceptual ideas? (indicate by ranking along the continuum below)



Do you have any comments regarding today's session?

We will meet with University of Alberta Museums again next week (January 25) at the same time, same place for a critique and to offer feedback on the work developed. **Final submissions will be due by noon on Monday, January 31.** I am also interested in making a visual record of the conceptual work you create for this project between the workshop and your final submission, if you could please bring that with you on the 25th I would greatly appreciate it.

Appendix 14

Comparing Ideation Methods - Workshop 1 - Post-Workshop Questionnaire - Post-Session Ideation

UNIVERSITY OF ALBERTA MUSEUMS DESIGN WORKSHOP

What level are you at in your design education? 300 400 500

In **concepting** your ideas between the workshop and today did you predominately use traditional sketching or work digitally? (indicate by ranking along the continuum below)



Do you feel either is a more **efficient** method at capturing/visualizing your conceptual ideas?
please elaborate

Do you feel either is a more **effective** method at capturing/visualizing your conceptual ideas?
please elaborate

Has this workshop made you **reconsider or favour** either method of capturing your ideas?
please elaborate

Do you feel you need to be able to draw to be able to capture/record you conceptual ideas?
please elaborate

If you generally capture/visualize your concepts digitally:

Do you feel liberated, or sometimes limited or by the technology?
please elaborate

Appendix 14

con't - Comparing Ideation Methods - Workshop 1 - Post-Workshop Questionnaire - Post-Session Ideation

When you begin at the computer do you have ideas in your mind that you are wanting to visualize or are you developing ideas in front of the screen? (indicate by ranking along the continuum below)



Do you have comments regarding the workshop generally? (please use the back if needed)

Thanks for your input. I hope this has been a positive experience for you.

Appendix 15

Comparing Ideation Methods - Workshop 1 - Post-Workshop Questionnaire Compiled Results

UNIVERSITY OF ALBERTA MUSEUMS DESIGN WORKSHOP NOTES (AFTER INITIAL SESSION)

six participants: 4-500 level; 1-400 level; 1-300 level

during the two 20 minute sessions of the workshop:

- all six all said that they felt they were more productive and produced more diverse solutions with sketching; whether it was the first or second conceiving session
- five participants felt it was because of the visualizing method; one was undecided

comments elaborating on this:

- "I can 'see' my ideas quicker and adjust accordingly
- "When I work I typically find that it's easier to generate more diverse idea[s] when sketching (by hand or on a program like Sketchbook Pro on the computer). The computer works better for refining ideas (typeface to use, etc)." *
- "I find with sketching you don't necessarily need a clear image in mind - you can just try something, see if it works then try something else. On the computer I get caught up in the bells and whistles ...Thus getting stuck on things like font choice."
- "I feel it is too slow for me to get my ideas down while sketching. Digital ideation is too slow for me." 2
- "I find that there are more possibilities when sketching. It is easier to just start drawing your ideas. You don't have to worry about being competent at a program. With sketching you can explore typography in a more expressive manner. Sketching allows for better hand-eye coordination as well."
- I find sketching more productive of comfortable for idea generation, but there is definitely good points to the digital aspect - this side is more productive when I actually have an idea or plan and is also good for research."
- four of the six stated that when beginning any design project their typical method for recording conceptual ideas was a balance between digital and sketching
- one indicated somewhere between a balance of both and sketching * (sketching on computer)
- one indicated fully beginning at sketching *

general comments:

- good to be aware of the methods that work best for me
- nice to begin working so quickly

Appendix 15

con't Comparing Ideation Methods - Workshop 1 - Post-Workshop Questionnaire Compiled Results

NOTES (FOLLOW UP ONE WEEK AFTER INITIAL SESSION)

five participants: 3-500 level; 1-400 level; 1-300 level

for concepting between the workshop and today:

- one worked equally between digital and traditional sketch
- two worked strictly digitally
 - one of these students indicated that after the concept is sketched they work strictly digitally
- two worked more digitally but included some traditional sketch (75/25)
 - one of these students indicated that the traditional sketches from the workshop inspired what they worked on digitally

Do you feel either is a more efficient method at capturing/visualizing your conceptual ideas?

- "Sketching is more efficient for generating a pile of ideas. Digital is more efficient for refining them."
- "I like to use both methods, either is efficient in its own way. Digital is good for research and actually planning how the document is built. Traditional is good for experimenting and playing with ideas."
- "I felt digital is more efficient due to it's flexibility."
- "If I have a direction in mind I find digital is more efficient because it is easy to try a lot of things."

Do you feel either is a more effective method at capturing/visualizing your conceptual ideas?

- "Sketching because ideas flow easier and they feel less precious."
- "I definitely think using a sketch is helpful for a first step. Using a digital method cleans up your sketched ideas so that it looks more presentable."

Has this workshop made you reconsider or favour either method of capturing your ideas?

- "No. Still work the same way."
 - "I definitely favour sketching for generating ideas. It is faster and more efficient."
- "I've been using my normal method...using both methods for different reasons."
 - "Yes and no. Digital has been really flexible and allow me to see faster but there is also a learning curve on technical skills."
- "No. Every project I approach differently depending on the content."

If general approach is digital: Do you feel liberated, or sometimes limited or by the technology?

- "I tend to get really picky with details at a too early conceptual stage when I use digital media."

Appendix 16

Comparing Ideation Methods - Workshop 2 - Consent Form

INFORMED CONSENT, DES 498, DIGITAL / SKETCHING WORKSHOP

Introduction

You are invited to participate in a research project conducted by Kevin Zak, MDes Candidate, Visual Communication Design, Department of Art and Design, University of Alberta.

This study looks at the use of a traditional or digital 'sketchbook' or 'design journal' as part of a formal design education.

This workshop will be approximately 60 minutes in length and will be photographed. You will be asked to fill out a short questionnaire following the workshop. Please do not sign the questionnaire. If the information collected is quoted or utilized in an MDes thesis report your anonymity will be maintained.

Your confidentiality and rights

The research with this project complies with the University of Alberta Standards for the Protection of Human Research Participants. Data recorded in the course of this research will be available only to myself and my supervisor. This study has been approved by the University of Alberta Faculty of Arts, Science and Law Research Ethics Board.

I, (please print your name) _____ acknowledge, understand,
and agree to all of the following:

- I have been invited to participate in this research study
- My participation in this study is voluntary.
- I have the right to withdraw from this study at any time without penalty.
- If I choose not to participate the data collected will not be utilized
- I have the right to my privacy, anonymity, and confidentiality. My name and personal information will not appear on any materials
- All of the personal information collected here will remain confidential
- I may be quoted directly in an MDes thesis, and possibly in related papers and presentations, but my anonymity will be maintained
- Any data collected in this study will be stored in a safe and secure place.

signature of participant _____ date _____

If you have any questions with regards to this research project, please contact

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Appendix 17

Comparing Ideation Methods - Workshop 2 - Outline of Workshop Structure

DES 498, DIGITAL / SKETCHING WORKSHOP

Friday, 11 March 2011

1. participants provided grad study waiver
2. intro / overview two 25 minute sessions with change of focus between sessions
conclude with short questionnaire

grad research: sketchbooks as part of a design education
how you capture/visualize your concepts when solving a design problem
photographing, please try not to let that disturb your process
3. collect waiver releasing information/photographs for grad study
4. break into two equal sized groups: one digital, one sketching
two 25 minute concepting sessions; 1. type focus, 2. more illustrative approach

first concept session (25 minutes): type focus
group one - sketching
group two - digital

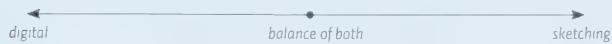
second concept session (25 minutes): illustrative approach
group one - digital
group two - sketching
5. conclude with short questionnaire
solicit for **follow-up interview**

Appendix 18

Comparing Ideation Methods - Workshop 2 - Post-Workshop Questionnaire

DIGITAL / SKETCHING WORKSHOP 11 march 2011

In tackling any design project where do you normally begin capturing/visualizing your conceptual ideas? (indicate by ranking along the continuum below)



Do you feel either is a more effective method at capturing/visualizing your conceptual ideas?
please elaborate

If you generally capture/visualize your concepts digitally:

Do you feel liberated, or sometimes limited or by the technology?
please elaborate

When you begin at the computer do you have ideas in your mind that you are wanting to visualize or are you developing ideas in front of the screen?
(indicate by ranking along the continuum below)



Did you find you were more productive in either of the sessions or that your solutions were more diverse from each other?

yes no

If so: In which session?

sketching digital

Was this the first or second session?

first second

Do you feel it was because of the method of visualizing your concepts?

yes no

please elaborate if you wish

Have you taken a drawing class as part your design education?

Do you feel you need to be able to draw to be able to capture/record you conceptual ideas?
please elaborate

Appendix 18

con't - Comparing Ideation Methods - Workshop 2 - Post-Workshop Questionnaire

Do you maintain a sketchbook for visual exploration/design ideation/visual resource?

*If you have any comments regarding today's session please use the back of this sheet
Thank you for your input and participation. If you are willing to provide 30 minutes
for a follow-up interview please let me know.*

Appendix 19

Comparing Ideation Methods - Workshop 2 - Post-Workshop Questionnaire Compiled Results

DIGITAL / SKETCHING WORKSHOP 11 march 2011

In tackling any design project where do you normally begin capturing/visualizing your conceptual ideas? (indicate by ranking along the continuum below)



Do you feel either is a more effective method at capturing/visualizing your conceptual ideas?

- both are effective in different ways - sketching for brainstorming / digital for focusing single idea
- project dependent - illustration/abstract poster=s sketch - catalogue/grid based=more digital
- sketching quicker for exploring ideas in early stages, on the computer I get to focused on style, grid, and functions of the program
- digital is great for inspiration, a designer should sketch their ideas to get out their initial thoughts instead of straight to the computer
- sketching allows me to put down exactly what I want without worrying about technical aspects
- like both - like using found images to bounce images in my head and also sketching them out
- depends on topic - digital helps compile requirements in text form and text is easier in digital - concepts best captured in sketches
- depending on the complexity of the final product sketching better to get ideas down if a digital version would be too complicated to produce
- digital is better for conceptualizing ideas based on repetition/computer generated graphics to visualize how it will look - sketching is better for experimenting with concepts
- depends on the project - this exercise both were equally useful for idea generation
- for info design/dealing with data I would prefer using a digital method - for layouts and initial visualization of graphics, sketching is quicker
- sketching generally more effective for capturing ideas - with this information design/researching facts digital is easier perhaps because statistics are more [repetitive] than other topics

If you generally capture/visualize your concepts digitally:

Do you feel liberated, or sometimes limited or by the technology?

- more often limited (by fonts, software...) better to have general idea to be visualized
- tend to use if more for writing information...more comfortable than drawing
- when I do I feel restricted
- often feel limited because of software knowledge - easier and faster by hand
- sometimes limited because of software knowledge
- feel limited sometimes, makes concepts feel too contained or "in a box"
- feel limited - takes more effort to force software to do something "out of the box" - sketching almost the opposite problem, hard to refine but easy to capture mistakes
- prefer digital when focus on typographic elements rather than something without many details to communicate an idea
- a bit of both - depends on task
- with research technology is liberating
- can be limiting in some ways and takes more time but is liberating when integrating type or color
- feel limited by technology sometimes - feel as though it is harder to master

Appendix 19

con't - Comparing Ideation Methods - Workshop 2 - Post-Workshop Questionnaire Compiled Results

When you begin at the computer do you have ideas in your mind that you are wanting to visualize or are you developing ideas in front of the screen?
(indicate by ranking along the continuum below)



Did you find you were more productive in either of the sessions or that your solutions were more diverse from each other?

yes no

If so: In which session?

sketching digital

Was this the first or second session?

first second

Do you feel it was because of the method of visualizing your concepts?

yes no

please elaborate if you wish:

- when developing concepts, easier to work things out on paper then research specifics later
- deciding what application to start, and just getting going is slow

Have you taken a drawing class as part your design education?

- all had taken drawing classes as part of their design education

Do you feel you need to be able to draw to be able to capture/record you conceptual ideas?

- to a degree
- no, sketching can be quite general and final product no always dependent on its accuracy
- no, they need to be able to communicate the idea but they can be messy; sketches are usually legible to the person whose hand it came from
- no, no need for strong drawing skills to capture ideas on paper
- easire to capture ideas when you can draw but it's not necdssary
- I like writing down words more than sketching; I visualize the concept in my head by looking at the word
- drawing helps to capture 3d ideas and solidifies the idea to get it out of my head to generate new ones
- no, simple symbols can represent a lot in the conceptual stages of a project
- sometimes yes, it helps to be able to draw realistically when visualizing a future photograh or illustration
- definitely helpful
- no, I tend to work very rough in sketches and move to digital for the transition to refinement
- no, a rough sketch can generate great ideas; you don't need an elaborate drawing

Appendix 19

con't - Comparing Ideation Methods - Workshop 2 - Post-Workshop Questionnaire Compiled Results

Do you maintain a sketchbook for visual exploration/design ideation/visual resource?

- yes (4)
- yes, fluctuates drastically from one project to the next
- several
- no sketchbook, sketch on various loose paper
- more notebook than sketchbook (2)
- no (2)

Appendix 20

Design Student Interviews - Questions

student interviews:

- when doing conceptual work do you work primarily digitally or on paper?*
- do you use a tablet for freehand sketching?*
- do you feel hand sketching affects the way you think?*
- is your sketchbook contained/collected? or loose? - project by project?*
- do you use writing/words when concepting?*
- do you notice the methods of classmates? other professionals?*
- do you use photography as part of your conceptual work?*
- do you keep a visual archive of design work? - is this digital or print?*
- do you like to be forced to work on concepts/solutions immed on the spot?*
would you find this helpful at 300 level?

Appendix 21

Design Student Interviews - Edited Selections

Participant J

works almost strictly in digital media

- uses ipad for sketching or "Adobe ideas" software - he uses either for color conceiving
- he makes a distinction between digital and pencil/paper - more comfortable on paper

feels he does think slightly differently when working between ipad/ideas and paper (he does not feel they impede conceptual thinking) (rough ideation)

but he definitely feels he thinks differently between software and paper

but he knows classmates who will do rough ideation in Illustrator

he did survey of process and found many people work conceptually in software (Illustrator)

found many people used sketchbooks for words - they move to software with formed ideas

realization in software after idea conceived through words on paper - he feels this is how he works, his sketchbook is not drawing as much as lists of things - he carries sketchbook to record words and ideas for projects - so not utilizing /relying on technology early in the process

tried 'evernote' for note taking - but not disciplined/successful - he feels it's more a habit of using paper and not the software that is the reason for this - easier to think - thinks of sketchbook/note book before technology - finds it easier to work/think on paper - more intuitive in terms of flexibility - quicker at writing than typing and quicker at thumbnailing on paper [more intuitive] - less conscious, thought directed at process - more focus on idea/concept - not being conscious of process or slowed down by process

for him - working process digitally "you stop thinking about what your doing" your less focused on getting idea down than "moving things around and placing things in just the right place"

when asked how he observed his classmates methods of working - in specific instance he noticed that people found it very hard to thumbnail, to the point of not wanting to do it - painful exercise to do - difficult because of the number of concepts demanded? or because of the drawing?

response: more the number of ideas asked for - cooncepts are difficult - "not enough teachers say it's okay... concepts can be very rough to start with and then refined... with thumbnailing you are just purging ideas"

Appendix 21

con't Design Student Interviews - Edited Selections

Participant J con't

he feels this is where the sketchbook is most effective for ideation - he feels his classmates underutilize the explorative potential sketchbooks - starting in software his feeling is that a concept is started as one idea (as opposed to many or multiple) and refined and refined - there is also no way to track process in Illustrator (software) short of versioning files

he feels that software [is not conducive] understands how designers work in an intuitive, conceptual sort of way

he did an assignment on process work and through that became aware how important process work is...this has affected professional work in terms of much more emphasis of tracking and recording process work - didn't track any process prior to that

liked to do exercise within limited time to generate and work through ideas - working in groups - get to see how other people work

when he opens Illustrator (software) to begin a project he begins to worry about the micro details and not so much the bigger picture - staying on paper longer helps maintain the ideas of focus to the big picture -

digital makes him focus on details - fixated on small areas...typography, or edges..

"based on the resolution of the thumbnail it just does not allow you to get caught up in details"

he makes a distinction between a sketchbook in the form of a book and sketching on loose paper... a book carries an meaning/importance because it is something and has a chronological history that is built in

feels his classmates generally do not see the value in sketching - and generally he feels that there is a lack of exploration - in whatever fashion, digital or on paper

Appendix 21

con't Design Student Interviews - Edited Selections

Participant K

has "sketchbook" on his phone but doesn't really use it, uses it for laying down blocks of color sometimes, and has taken a photo and worked over top of the photo

prefers line drawings on paper - but if its more color he has started digital with tablet - sometimes it's also what is closer at hand

sketch in "Photoshop" or "Painter" with tablet; "Painter" good color wheel - he doesn't save independent file versions in Illustrator but saves multiple working versions within one file - building out from artboard

uses technology interchangeably - based on where he feels he wants the end result to be - ie. organic lines from paper

color thumbnails in photoshop for vcd - but he does not feel that sketched lines can represent type visually

*- ideally starts with a broad concept in his head when he begins
- will start in technology if nothing is strongly defined (at the worst of times) then technology is present from start to finish - but this is not his ideal working method*

like to have solid idea in his head before he begins

work differently between paper and digital? no, he feels he does draw differently between the two; begins working in one of the other based on where he wants the end result to be

sketches on paper during research/information gathering - carries real sketchbooks at all times (4)

hadn't thought before to sketch an idea to get it out of his head, makes a record of it to move beyond

feels his sketchbook is a personal space and feels he filters what he creates there because of it

[most of his book(s) are visual - not lots of writing]

uses iphone and video as visual record and resource for exploration

Appendix 21

con't Design Student Interviews - Edited Selections

Participant K con't

- he likes the idea of the flexibility that technology might offer - not for the sake of technology but the combining of sketch, image, hand drawing, together in one - does not feel inhibited by any software and is not precious about paper [but he's particular about paper opacity, quality of line, and surface finish]

uses transparency of page by redrawing something on the opposite side

first instinct for capturing an idea is iphone - if tech and sketchbook equal, he will sketch because it is easier to find....not specific about which he uses - he sees sketchbook as means to an end background more digital from younger age - as teen interest in digital animation - came to use a sketchbook much later so is not the base default, it was a conscious effort at first - started in university



